

MPEG4AAC Low Complexity Decoder (v01.30.03) on C64x+

FEATURES

- eXpressDSP™ Digital Media (XDM 1.0 IAUDDEC1) compliant
- Validated on the DM644x EVM
- MPEG4 AAC Low Complexity (LC) object type implementations supported
- MPEG2 AAC Low Complexity (LC) object type implementations supported
- Decoding of mono and stereo streams supported
- RAW data input format supported
- Audio Data Interchange Format (ADIF) and Audio Data Transport Stream (ADTS) input formats, encoded with ISO/IEC 13818-7 or 14496-3 compliant encoders supported
- Sampling frequency range of 8 khz – 96 khz as per ISO/IEC 14496-3 standard supported

- Supports bitrates ranging from 8kbps to 1152kbps
- Maximum bit-rate based on sampling frequency supported as per standard
- Validated on the DM644x EVM

DESCRIPTION

Advanced Audio Coding (AAC) is an audio data compression format. This coding technique uses a perceptual filter bank, a sophisticated masking model, noise-shaping techniques, and channel coupling. It provides the highest possible quality at smaller bit-rates. It is validated on DM644x EVM with code composer studio version 3.2.37.12 and code generation tools version 6.0.8.

PRODUCT PREVIEW



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Performance Summary

This section describes the performance of MPEG4AAC Low Complexity Decoder.

Table 1. Configuration Table

CONFIGURATION	ID
MPEG4 AAC LC	MPEG4_AAC_001

Table 2. Cycles Information - Profiled on DM644x EVM with Code Generation Tools Version 6.0.8

CONFIGURATION ID	PERFORMANCE STATISTICS (IN MEGA CYCLES PER SEC) ⁽¹⁾⁽²⁾		
	TEST DESCRIPTION	AVERAGE	PEAK
MPEG4_AAC_001	LC - mj_48khz_128000.aac	16.7	20.75

- (1) Measured with program memory, stack, and I/O buffers in external memory and with cache configuration 32K-bytes L1P cache, 16 K-bytes L1D cache, 64K-bytes L2 cache, L1 and L2 Cache Invalidation done for every frame
(2) Measured with frame size= 1024 samples for LC Profile

Table 3. Memory Statistics - Generated with Code Generation Tools Version 6.0.8

CONFIGURATION	MEMORY STATISTICS ⁽¹⁾				TOTAL
	PROGRAM MEMORY	DATA MEMORY			
		INTERNAL	EXTERNAL	STACK	
MPEG4_AAC_001	46.4	0	40.4	5.0	91.8

- (1) All memory requirements are expressed in kilobytes (1K-byte= 1024 bytes).

Table 4. Data Memory Split-up

CONFIGURATION	DATA MEMORY – EXTERNAL ⁽¹⁾		
	SHARED		INSTANCE ⁽²⁾
	CONSTANTS	SCRATCH	
MPEG4_AAC_001	24.2	9.0	7.2

- (1) All memory requirements are expressed in kilobytes
(2) Does not include I/O buffers

Notes

- I/O buffers
 - Input buffer size = 1648 bytes
 - Output buffer size = 8192 bytes for 16-bit audio sample size, 2 channel output (stereo)
- Total data memory for N non pre-emptive instances = Constants + Runtime Tables + Scratch + N* (Instance + I/O buffers + Stack)
- Total data memory for N pre-emptive instances = Constants + Runtime Tables + N* (Instance + I/O buffers + Stack + Scratch)

References

- ISO/IEC 13818-7:2003 Information technology -- Generic coding of moving pictures and associated audio information -- Part 7: Advanced Audio Coding (MPEG2 AAC standards document)
- ISO/IEC 14496-3:1999(E) Information technology -- Coding of audio-visual objects -- Part 3: Audio (MPEG4 AAC standards document)
- ISO/IEC 14496-3:2001/AMENDMENT 1 Bandwidth extension (MPEG4 AAC-HE standards document)
- *MPEG4AAC Low Complexity Decoder on C64x+ User Guide* (literature number SPRUEA8D)

Glossary

Term	Description
Constants	Elements that go into .const memory section
Scratch	Memory space that can be reused across different instances of the algorithm
Shared	Sum of constants and scratch
Instance	Persistent-memory that contains persistent information - allocated for each instance of the algorithm

Acronyms

Acronym/Abbreviation	Description
ADTS	Audio Data Transport Stream
ADIF	Audio Data Interchange Format
AAC	Advanced Audio Coding
AAC-HE	High Efficiency Advanced Audio Coding
DV-EVM	Digital Video Evaluation Module
ISO	International Organization for Standardization
IEC	International Electro-Technical Commission
MPEG4	Moving Pictures Experts Group-4
XDM	eXpressDSP Digital Media

Revision History

This datasheet revision history highlights the technical changes made to the SPRS322C codec specific data manual to make it SPRS322D.

Table 5. Revision History of MPEG4AAC LC Decoder on C64x+

SECTION	CHANGES
Table 1	Features: <ul style="list-style-type: none"> • Added new feature Supports bit-rates ranging from 8kbps to 1152kbps.
Table 2	Cycles Information: <ul style="list-style-type: none"> • Modified average and peak values
Table 3	Memory Statistics: <ul style="list-style-type: none"> • Modified Program Memory and Data Memory values

Table 5. Revision History of MPEG4AAC LC Decoder on C64x+ (continued)

SECTION	CHANGES
Table 4	External Data Memory Split-Up: <ul style="list-style-type: none"><li data-bbox="591 310 1013 331">• Modified Data Memory - External values

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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