



- eXpressDSP compliant
- eXpressDSP Digital Media (XDM1.0) compliant
- Supports only 16 bit PCM samples as input.
- Only Constant Bit Rate (CBR) encoding is supported
- For mono and stereo channel, input sampling frequencies from 16 KHz to 48 KHz are supported. For Multichannel (5 and 5.1 channel), input sampling frequencies from 32 KHz to 48KHz are supported.
- Only AAC-LC output format supported
- Supports maximum of 6 channels including LFE.
- Bit rates based on sampling frequency, Audio Object Type and number of channels are supported
- Audio Data Interchange Format (ADIF), Audio Data Transport Stream (ADTS), and rawoutput format supported
- ISO/IEC 14496-3 (MPEG 4 AAC LC) and ISO/IEC 13818-7 (MPEG 2-AAC LC) standards compliant
- Validated on Centaurus with Code Composer Studio version 4.2.0.10018 and Code Generation Tools version 7.2.3

description

AAC is one of the most popular audio compression standards across wide spectrum of application ranging from portable player, cell phones, music systems, internet, and so forth. It is validated on DM8148 EVM with Code Composer Studio version 4.2.0.10018 and Code Generation Tools version 7.2.3.

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Summary of performance

Table 1. Configuration Table

CONFIGURATION	ID
MPEG4 AAC LC , 2 channel	MP4AACLC_ENC_001
MPEG4 AAC LC , 5 channel	MP4AACLC_ENC_002
MPEG4 AAC LC , 5.1 channel	MP4AACLC_ENC_003
MPEG2 AAC LC , 2 channel	MP2AACLC_ENC_001
MPEG2 AAC LC , 5 channel	MP2AACLC_ENC_002
MPEG2 AAC_LC , 5.1 channel	MP2AACLC_ENC_003

Table 2. Cycles Information – Profiled on DM8148 EVM platform with Code Generation Tools Version 7.2.3

CONFIGURATION ID	PERFORMANCE STATISTICS (IN MEGA CYCLES PER SEC) ¹			
	TEST DESCRIPTION	NUMBER OF CHANNELS IN INPUT	AVERAGE	PEAK ²
MP4AACLC_ENC_001	48 KHz – 128 kbps	2	18.5	18.91
MP4AACLC_ENC_002	44.1KHz-356 kbps	5	35	39.69
MP4AACLC_ENC_003	48KHz – 356kbps	6	51.95	53.12
MP2AACLC_ENC_001	48KHz-128kbps	2	18.71	19.43
MP2AACLC_ENC_002	44.1KHz-356kbps	5	34.84	39.64
MP2AACLC_ENC_003	48KHz – 356 kbps	6	50.32	51.4

¹ Profiling is done by thrashing input and output buffers after encoding each frame of AAC
² Measured with program memory, stack, and I/O buffers in external memory and with cache configuration 32K-bytes L1P cache, 32K-bytes L1D cache, 64K-bytes L2 cache.
³ Average and peak MCPS measurements can vary by +/-5%.

Table 3. Memory Statistics - Generated with Code Generation Tools Version 7.2.3

CONFIGURATION ID	MEMORY STATISTICS ³				
	PROGRAM MEMORY	DATA MEMORY			TOTAL
		INTERNAL	EXTERNAL	STACK	
MP4AACLC_ENC_001	100.78	Not used	65.66	10	176.44
MP4AACLC_ENC_002	100.78	Not used	115.39	10	226.17
MP4AACLC_ENC_003	100.78	Not used	132.02	10	242.8
MP2AACLC_ENC_001	100.78	Not used	64.54	10	175.32
MP2AACLC_ENC_002	100.78	Not used	114.28	10	225.06

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MP2AACLC_ENC_003	100.78	Not used	130.91	10	241.69
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⁵ All memory requirements are expressed in kilobytes (1K-byte = 1024 bytes).

Table 4. Internal Data Memory Split-up

CONFIGURATION ID	DATA MEMORY – INTERNAL ⁴		
	SHARED		INSTANCE ⁵
	CONSTANTS	SCRATCH	
MP4AACLC_ENC_001	Not used	Not used	Not used
MP4AACLC_ENC_002	Not used	Not used	Not used
MP4AACLC_ENC_003	Not used	Not used	Not used
MP2AACLC_ENC_001	Not used	Not used	Not used
MP2AACLC_ENC_002	Not used	Not used	Not used
MP2AACLC_ENC_003	Not used	Not used	Not used

⁴ All memory requirements are expressed in kilobytes

⁵ Does not include I/O buffers

Table 5. External Data Memory Split-up

CONFIGURATION ID	DATA MEMORY – EXTERNAL ⁶		
	SHARED		INSTANCE ⁷
	CONSTANTS	SCRATCH	
MP4AACLC_ENC_001	20.52	25.32	19.82
MP4AACLC_ENC_002	20.52	49.66	45.21
MP4AACLC_ENC_003	20.52	57.81	53.69
MP2AACLC_ENC_001	20.52	24.41	19.61
MP2AACLC_ENC_002	20.52	48.76	45
MP2AACLC_ENC_003	20.52	56.91	53.48

⁶ All memory requirements are expressed in kilobytes

⁷ Does not include I/O buffers

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Notes

- I/O buffers:
 - Output buffer size = 4608 bytes
 - Input buffer size = 1024 words per channel
- 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 IS 14496-3 Information Technology -- Coding of Moving Pictures and Associated Audio for Digital Storage Media at up to about 1.5 Mbps -- Part 3: Audio
- ISO/IEC IS 13818-7 Information Technology -- Generic Coding of Moving Pictures and Associated Audio Information -- Part 7 Advanced Audio Coding
- User Guide for AAC Encoder on C64x+ (Literature Number: SPRUHB5)

Glossary

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

AAC	Advanced Audio Coding
ADIF	Audio Data Interchange Format
ADTS	Audio Data Transport Stream
CBR	Constant Bit Rate
EVM	Evaluation Module
Kbps	Kilo bits per second
KHz	Kilo Hertz
LC	Low Complexity
LFE	Low Frequency Enhancement.
MPEG	Moving Picture Experts Group
PCM	Pulse Code Modulation
VBR	Variable Bit Rate
XDAIS	eXpressDSP Algorithm Interface Standard
XDM	eXpressDSP Digital Media

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