Dolby AC3 Version3 Decoder (v1.10) on C64x+

FEATURES

- **eXpressDSP™ Algorithm Interface Standard (XDAIS) compliant**
- **eXpressDSP Digital Media (XDM) Interface compliant**
- **Validated in DM644x EVM with Code Composer Studio version 3.2.37.12 and code generation tools version 6.0.8**
- **32, 44.1 and 48 kHz output sampling rates and 32-640 kbps input bit rates supported**
- **All specified audio coding modes namely Dual Mono (1+1), 1/0, 2/0, 3/0, 2/1, 3/1, 2/2, 3/2 supported**
- **Dialog Normalization, Dynamic Range Control, and Peak Level Control supported**
- **Dual-mono modes: Stereo, Ch1 Mono, Ch2 Mono and Mixed Mono supported**
- **Implementation is compliant with Dolby Digital Development Kit version 3.0 (7.1.0)**
- **Implementation is compliant with Karaoke Aware and Karaoke capable**
- **Dolby Digital Extended Bit stream Syntax provided in Annex D of the ATSC specifications supported**
- **16 and 24-bit PCM output samples supported. The output samples are written as 32-bit words where the 24-bit sample word is towards the MSB and LSB 8-bits are zero padded which can be ignored.In case of 16-bit PCM samples, the MSB 16-bit has the PCM data and the LSB 16-bits are zero-padded.**
- **Block format data output and sample-interveaved data format supported**
- **Up-Mix and Pro-Logic processing not supported**
- **DRM not supported**

DESCRIPTION

- Dolby AC3 Version3 Decoder is an audio coding technology used to store and transmit high quality multi-channel sound. This standard is used in movie and home theaters and has been choosen as the audio standard for next-generation systems such as DVD, HDTV, digital broadcasts, computer audio, and DVD ROMs for video games.

PRODUCT PREVIEW

Performance Summary

This section describes performance based on the following assumptions:.

Table 1. Configuration Table

CONFIGURATION	ID
Release	AC3_DEC_001

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

CONFIGURATION ID	PERFORMACE STATISTICS (MEGA CYCLES PER SECOND(1))		
	TEST DESCRIPTION	AVERAGE	PEAK
AC3_DEC_001	Difmus6.ac3	36.0	45.6

(1) Measured with program memory,stack, and I/O buffers in external memory and with cache configuration:64K-bytes L2, 32K-bytes L1P, and 16k-bytes L1D cache with cache thrashing.

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

CONFIGURATION ID	MEMORY STASTICS				TOTAL
	PROGRAM MEMORY	DATA MEMORY			
		INTERNAL	EXTERNAL(1)	STACK	
AC3_DEC_001	49.2	Not used	36.4	1.5	87.1

(1) Internal memory is not used.

Table 5. Internal Data Memory Split-Up

CONFIGURATION ID	DATA MEMORY - INTERNAL(1)		
	SHARED		INSTANCE
	CONSTANTS	SCRATCH	
AC3_DEC_001	Not used	Not used	Not used

(1) All memory requirements are expressed in kilobytes.

Table 5. External Data Memory Split-Up

CONFIGURATION ID	DATA MEMORY - EXTERNAL(1)		
	SHARED		INSTANCE
	CONSTANTS	SCRATCH	
AC3_DEC_001	10.1	4.6	21.7

(1) All memory requirements are expressed in kilobytes.

Table -. Co Processor(s) Memory Statistics (1)

CONFIGURATION ID	SEQ DATA MEMORY	SEQ PROG MEMORY	IMX WORKING MEM	IMX IMG BUF	IMX CMD MEM
AC3_DEC_001	0	0	0	0	0

(1) The decoder does not use co-processors and hence all the values are zero.

Notes

- I/O Buffer Size:
- Input Buffer Size = 4K-bytes
- Output Buffer Size = 36K-bytes
- Total Data Memory for N *Non-Pre-Emptive* Instances = Constants + Runtime Tables +Scratch+ NI(Instance+I/O buffers + Stack)
- Total Data Memory for N *Pre-Emptive* Instances = Constants + Runtime Tables +Scratch+ NI(Instance+I/O buffers + Stack + Scratch)

References

- eXpressDSP Algorithm Interoperability Standard (TMS320Algorithm Interface Standard)
- Dolby AC3 Version3 Decoder on C64x+ User Guide(Literature Number SPRUEI5A)

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	Description
AC3	Audio Coding 3
ATSC	Advance Television Systems Committee
DRM	Digital Rights Management
EVM	Evaluation Module
PCM	Pulse Code Modulation
XDAIS	eXpressDSP Algorithm Interface Standard
XDM	eXpressDSP Digital Media

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