

Ittiam AC3 Encoder

AC3 Encoder

AC-3 is a worldwide audio coding standard, adopted by several consumer applications, like ATSC and DVB digital terrestrial television broadcasting, several cable and satellite television standards, worldwide DVD audio, compatible laserdisc audio, and emerging PC applications. Its underlying perceptual coding engine provides high quality multi-channel audio at low bit-rates, a flexible format, integrated support for important consumer features, and moderate implementation complexity. It also supports a number of system features that improve the overall listening experience, such as volume normalization and dynamics processing.

The DDCE is reduced feature reduced complexity version of professional Dolby Digital AC3 Encoder. The DDCE bitstream is fully compatible with the ATSC AC-3 specification (ATSC A/52). DDCE operates on a PCM frame of size 1536 samples. The frame internally is subdivided into 6 blocks of 256 samples each. Reference encoder in the current document henceforth refers to DDCE.

Note on Licensing: Ittiam's AC-3 Encoder implementation on C64x is provided subject to the terms and conditions of the Dolby Laboratories Licensing Corporation and requires certification of the end product.

Features

- Encodes upto 2 channels PCM stream into AC-3.
- Supports bitrates from 64 kbps to 448 kbps.
- Supports sample rates of 32, 44.1 and 48 kHz.
- Supports a simple C callable with flexible memory allocation scheme.
- Multi-channel reentrant software.

Encoder Validation

The DDCE implementation has been subjected to both white box and black box testing. The implementation has been validated using the test procedures outlined by Dolby Laboratories. The implementation has been found to satisfy all the quality and compliance requirements set by Dolby.

Resource requirements on c64x plus Processor

Function	MCPS	Pgm	Tables	Static	Scratch
	Peak	ROM (kB)		RAM (kB)	
Encode	17.44	58	7.5	2.5	21.5

Note

The Data Memory mentioned in the above Table does not include Input/ Output buffers.

MCPS/MIPS indicate the CPU usage for processing Stereo/448 Kbps/48 KHz.

MIPS/MCPS measurement on 0 wait-state memory access



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Details of c64x plus Resources required

CPU Loading

CPU	Simulator	
Description	Ave MCPS	Peak MCPS
448 kbps, 48kHz, 2 channel	11.98	17.44

Memory Usage

Program	Tables	Static	Scratch	Input	Output
58.0	7.5	2.5	21.5	6	3.75

Note:

- I/O Buffers
 - Input Buffer Size : 6 kB
 - Output Buffer Size : 3.75 kB
- Performance generated on CCS 3.2.39.5 with C64x+ Cycle Accurate Simulator with 0 wait state memory access
- MCPS numbers on the hardware will vary with the I-Cache and D-Cache size and with the memory configuration/placement
- 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
- Memory numbers mentioned are in kB, kB refers to Kilo bytes.
- File used for the profile is DC_lim.pcm

Notice

Ittiam Systems reserves the right to make changes to its products or discontinue any of its products or offerings without notice. Ittiam warrants the performance of its products to the specifications applicable at the time of sale in accordance with Ittiam's standard warranty.