

IGSAAC002A MPEG-2/4 AAC-LC Encoder on ARM9E

Features

- ◆ **Conforms to encoder part of ISO/IEC 13818-7 MPEG-2 AAC-LC and ISO/IEC 14496-3 MPEG-4 AAC-LC specifications:**
 - **Sampling frequency: 8 / 11.025 / 12 / 16 / 22.05 / 24 / 32 / 44.1 / 48 / 64 / 88.2 / 96kHz**
 - **Bit rate: 32kbps - 320kbps**
 - **Supports MPEG-2 ADIF, MPEG-2 ADTS, and MPEG-4 RAW* Format**
 - **Supports mono and stereo channel**
 - **Supports average bit rate (ABR) and variable bit rate (VBR) coding modes**
- ◆ **Optimized for ARMv5E processor family**
- ◆ **Requires low CPU power:**
 - **28MIPS / 34MHz (Peak) @ Stereo / 44.1kHz / ABR 128kbps**
 - **19MIPS / 24MHz (Average) @ Stereo / 44.1kHz / ABR 128kbps**
 - **25MIPS / 32MHz (Peak) @ Stereo / 44.1kHz / VBR**
 - **20MIPS / 24MHz (Average) @Stereo / 44.1kHz / VBR**
- ◆ **Requires small memory space:**
 - **Program Memory (ROM): 14Kbytes**
 - **Constant Memory (ROM): 15Kbytes**
 - **Data Memory (RAM): 32Kbytes**
- ◆ **Provides high quality audio performance:**
 - **ODG = -0.85 (Average) @ Stereo / 44.1kHz / ABR 128kbps**

- **ODG = -0.26 (Average) @ Stereo / 44.1kHz / ABR 192kbps**
- **ODG = -0.07 (Average) @ Stereo / 44.1kHz / ABR 320kbps**
- **ODG = -0.23 (Average) @ Stereo / 44.1kHz / VBR**
- ◆ **Supports reentrant codes and flexible memory allocation scheme**
- ◆ **Provides compact software API**

Overview

Advanced Audio Coding Low Complexity or AAC-LC is an implementation of MPEG-2 (ISO/IEC 13818-7) and MPEG-4 (ISO/IEC 14496-3) Audio Standard. The novel algorithms of AAC-LC have been designed to replace the MP3 by providing the superior audio performance than it at the same bit rate.

IGSAAC002A MPEG-2/4 AAC-LC Encoder or GUC AAC Encoder is a firmware library on ARMv5E processor family. This library owns good capabilities as low CPU power, small memory space, high quality audio performance, and compact software API to facilitate application development.

Applications

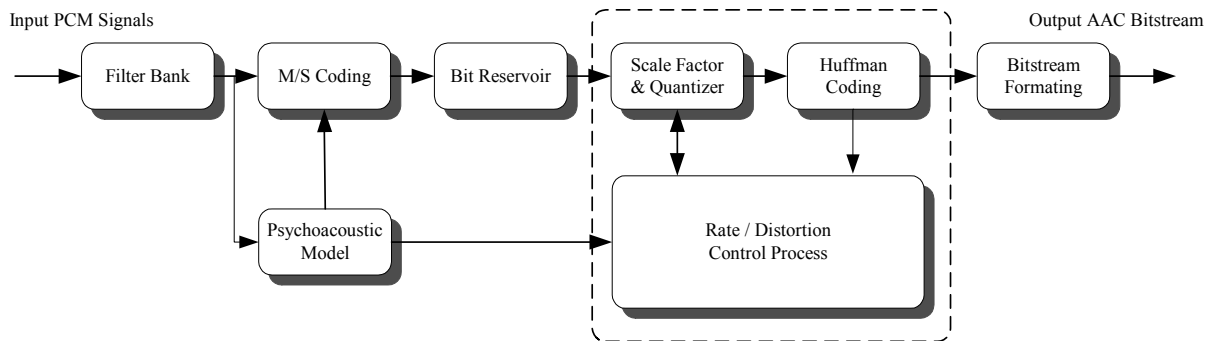
- ◆ Portable Media Player / Recorder
- ◆ Mobile Facility
- ◆ Set-Top Box
- ◆ Digital TV
- ◆ Digital Broadcasting
- ◆ Home Entertainment System

* IGSAAC002A AAC-LC Encoder needs an additional MPEG-4 Wrapper to produce the compressed track with MPEG-4 file format.

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Block Diagram



GUC AAC Encoder block diagram

Description

The main functions of GUC AAC Encoder are illustrated as above block diagram. The Filter Bank is used to do time to frequency transformation and its output spectrum is fed into M/S coding and Psychoacoustic Model. The M/S coding provides an efficient manner to control the image of coding noise and to reduce the redundancy of stereo channel. The Psychoacoustic Model adopts the concepts of human auditory system to determine the allowable distortions. The encoder iteratively quantizes the spectral coefficients, computes the bytes of Huffman codes, and derives distortion noise according to the allowable distortion and the frame bit rate. Here, the frame bit rate is managed by the Bit Reservoir. Lastly, the Rate & Distortion Controller produce the optimized Huffman codes, and then the Bitstream Formatting packs them with the side information and header to form the AAC-LC bitstream.

Deliverables

- ◆ The RVDS (v2.2) library package of AAC-LC Encoder on ARM9E
- ◆ The Linux GNU-ARM tool chain (v4.1.1) library package of AAC-LC Encoder on ARM9E
- ◆ The evaluation program (Win32 console on WinXP/2000) of AAC-LC Encoder on ARM9E
- ◆ Document Set including One Page Summary and Technical Manual

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