

IGSMP3002A MPEG-1 Audio Layer 3 (MP3) Encoder on ARM9E

Features

- ◆ **Conforms to encoder part of ISO/IEC 11172-3 MPEG-1 Audio Layer 3 specification:**
 - Sampling frequency: 32 / 44.1 / 48 kHz
 - Bit rate: 32kbps - 320kbps
 - Supports MP3 file format
 - Supports mono and stereo channel
 - Supports constant bit rate (CBR) coding mode
- ◆ **Optimized for ARMv5E processor family**
- ◆ **Requires low CPU power:**
 - 29MIPS / 37MHz @ Stereo / 48kHz / 128kbps (Peak)
 - 23MIPS / 30MHz @ Stereo / 48kHz / 128kbps (Average)
 - 26MIPS / 34MHz @ Stereo / 44.1kHz / 128kbps (Peak)
 - 21MIPS / 27MHz @ Stereo / 44.1kHz / 128kbps (Average)
- ◆ **Requires small memory space:**
 - Program Memory (ROM): 15Kbytes
 - Constant Memory (ROM): 12Kbytes
 - Data Memory (RAM): 26Kbytes
- ◆ **Provides high quality audio performance:**
 - ODG = -0.96 (Average) @ Stereo / 44.1kHz / 128kbps
 - ODG = -0.30 (Average) @ Stereo / 44.1kHz / 192kbps

- ODG = -0.05 (Average) @ Stereo / 44.1kHz / 320kbps

- ◆ **Supports reentrant codes and flexible memory allocation scheme**
- ◆ **Provides compact software API**

Overview

MPEG-1 Audio Layer 3 is a popular digital audio compression standard, and is commonly known as MP3. It is designed faithfully to reproduce the high quality audio performance with greatly reduced data rate. The syntax of the MP3 bitstream and the description of decoding process are defined in ISO/IEC 11172-3. The description for encoder scheme is an informative annex to the standard. The non-mandatory encoder specification makes it possible for users to encode MP3 bitstream with the other efficient algorithms.

GUC IGSMP3002A MPEG-1 Audio Layer 3 (MP3) Encoder or GUC MP3 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

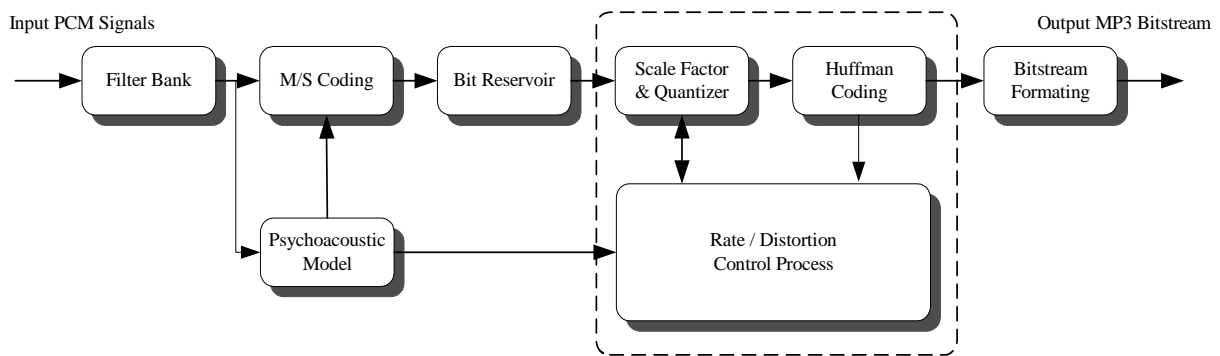
- ◆ Portable Media Player / Recorder
- ◆ Mobile Facility
- ◆ Set-Top Box
- ◆ Digital TV

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- ◆ Digital Broadcasting
- ◆ Home Entertainment System

Block Diagram



GUC MP3 Encoder block diagram

Description

The main functions of GUC MP3 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 MP3 bitstream.

Deliverables

- ◆ The RVDS (v2.2) library package of MP3 Encoder on ARM9E
- ◆ The Linux GNU-ARM tool chain (v4.1.1) library package of MP3 Encoder on ARM9E
- ◆ The evaluation program (Win32 console on WinXP/2000) of MP3 Encoder on ARM9E
- ◆ Document Set including One Page Summary and Technical Manual

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