

# IGSMP2002A MPEG-1/2 Audio Layer 1/2 (MP1/2) Encoder on ARM9E

## Features

- ◆ **Conforms to encoder part of ISO/IEC 11172-3 MPEG-1 Layer 1/2 Encoder and ISO/IEC 13818-3 MPEG-2 Layer 1/2 Encoder specifications:**
  - Sampling frequency: 16 / 22.05 / 24 / 32 / 44.1 / 48 kHz
  - Bit rate: 8kbps - 448kbps
  - Supports mono and stereo channel
  - Supports intensity stereo coding
  - Supports constant bit rate (CBR) and variable bit rate (VBR) coding modes
  - Supports error protection
- ◆ **Optimized for ARMv5E processor family**
- ◆ **Requires low CPU power:**
  - 48 MIPS / 64 MHz (Peak) @ Layer 1 / Stereo / 44.1 kHz / CBR 160kbps
  - 55 MIPS / 73 MHz (Peak) @ Layer 1 / Stereo / 44.1 kHz / VBR
  - 26 MIPS / 34 MHz (Peak) @ Layer 2 / Stereo / 44.1 kHz / CBR 160kbps
  - 29 MIPS / 39 MHz (Peak) @ Layer 2 / Stereo / 44.1 kHz / VBR
- ◆ **Requires small memory space:**
  - Program Memory (ROM): 16Kbytes
  - Constant Memory (ROM): 14Kbytes
  - Data Memory (RAM): 29Kbytes
- ◆ **Provides high quality audio performance:**
  - ODG = -1.66 (Average) @ Layer 1 /

Stereo / 44.1kHz / CBR 160kbps

- ODG = -0.24 (Average) @ Layer 1 / Stereo / 44.1kHz / VBR
- ODG = -1.40 (Average) @ Layer 2 / Stereo / 44.1kHz / CBR 160kbps
- ODG = -0.28 (Average) @ Layer 2 / Stereo / 44.1kHz / VBR
- ◆ **Supports reentrant codes and flexible memory allocation scheme**
- ◆ **Provides compact software API**

## Overview

MPEG-1/2 Audio Layer 1/2 or MP1/2 is a lossy audio compression format specified in ISO/IEC 11172-3 and ISO/IEC 13818-3 standard documents. The algorithm makes it has better performance than MP3 at high bit rate (256kbps to 384kbps) and has more error resilient than MP3. The primary applications of MP1/2 range from digital audio broadcasting (DAB), digital video broadcasting (DVB) to the portable media devices.

GUC IGSMP2002A MPEG-1/2 Audio Layer 1/2 Encoder or GUC MP1/2 Encoder is a firmware library conforms to MP1/2 specification 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

**Global Unichip Corp.**

TEL: +886-3-5646600

<http://www.globalunichip.com>

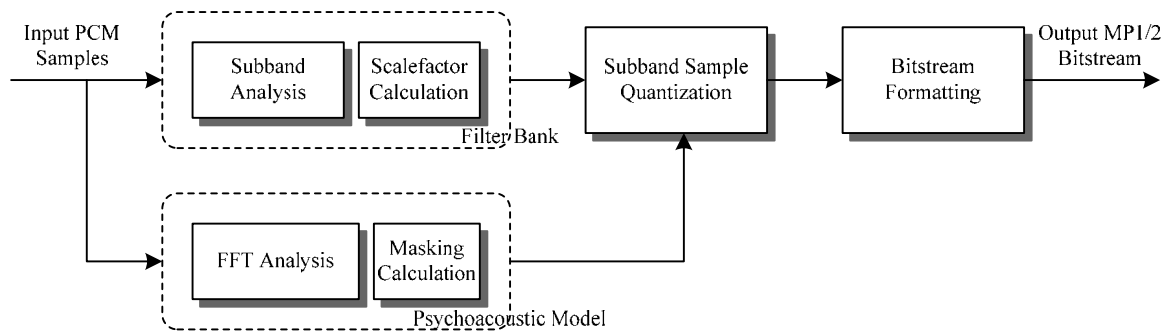
FAX: +886-3-5646000

e-mail: [info@globalunichip.com](mailto:info@globalunichip.com)

No. 10, Li-Hsin 6th Rd., Hsinchu Science Park, Hsinchu City 300, Taiwan

- ◆ Mobile Facility
- ◆ Set-Top Box
- ◆ Digital TV
- ◆ Digital Broadcasting
- ◆ Home Entertainment System

## Block Diagram



GUC MP1/2 Encoder block diagram

## Description

The main function blocks of GUC MP1/2 Encoder are illustrated as above diagram. First, the input PCM samples are fed into the Filter Bank and Psychoacoustic Model. The Filter Bank separates the frequency ingredient of input PCM samples into 32 equal-width subbands. The Scalefactor Calculation chooses the largest coefficient of each subband as the scalefactor and then normalizes the subband coefficients by corresponding scalefactor. For the Psychoacoustic Model, it adopts the concepts of human auditory system to determine the allowable distortions. According to the frame rate and the allowable distortions, the Subband Sample Quantization can derive the optimized quantized coefficients. At last, the Bitstream Formatting packs the quantized coefficients with the side information and header as a MP1/2 frame bitstream.

## Deliverables

- ◆ The RVDS (v2.2) library package of MP1/2 Encoder on ARM9E
- ◆ The Linux GNU-ARM tool chain (v4.1.1) library package of MP1/2 Encoder on ARM9E
- ◆ The evaluation program (Win32 console on WinXP/2000) of MP1/2 Encoder on ARM9E
- ◆ Document Set including One Page Summary and User Manual

## *Global Unichip Corp.*

TEL: +886-3-5646600      <http://www.globalunichip.com>  
 FAX: +886-3-5646000      e-mail: [info@globalunichip.com](mailto:info@globalunichip.com)  
 No. 10, Li-Hsin 6th Rd., Hsinchu Science Park, Hsinchu City 300, Taiwan