創意電子
GLOBAL UNICHIP CORP.

IGSWMA001A WMA Standard Decoder on ARM9E

Features

- **Conforms to Microsoft® WMA 9 Standard Decoder specification:**
  - **Sampling frequency: 8kHz - 48kHz**
  - **Bit rate: 5kbps - 384kbps**
  - **Supports ASF format**
  - **Supports mono and stereo channel**
  - **Supports High-, Mid-, and Low-rate coding mode**
  - **Supports seek mechanism within a WMA bitstream**
- **Certified by the Microsoft®**
- **Optimized for ARMv5E processor family**
- **Requires low CPU power:**
  - **High rate: 18MIPS / 22MHz @ Stereo / 44.1kHz / 320kbps**
  - **Mid rate: 13MIPS / 17MHz @ Stereo / 44.1kHz / 32kbps**
  - **Low rate: 9MIPS / 11MHz @ Stereo / 16kHz / 20kbps**
- **Requires small memory space*:**
  - **Program Memory (ROM): 30Kbytes**
  - **Constant Memory (ROM): 38Kbytes**
  - **Data Memory (RAM): 45Kbytes**
- **Supports reentrant codes and flexible memory scheme**
- **Provides compact software API**

Overview

Microsoft® Windows Media™ Audio is the most popular audio codec in Windows Media technology, and is commonly known as WMA. The WMA 9 series covers a diversity of multimedia applications, and is divided into four different profiles: “Standard”, “Professional”, “Lossless,” and “Voice”. The WMA Standard algorithm makes it possible to produce CD quality audio at data rates as low as 64 kbps.

The IGSWMA001A WMA Standard Decoder is a firmware library on ARMv5E processor family. This implementation supports the high-, mid-, and low-rate WMA bitstreams as well as the ASF format. It is also fully compliant to Microsoft® Windows Media™ Technology Implementation Test Specification for: Windows Media Audio Standard Decoder. In addition, the library is combined with a flexible memory configuration scheme, optimized algorithms, and compact software API, which significantly reduce the power consumption and memory usage to facilitate application development.

Applications

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

*** ASF Parser is not included in IGSWMA001A WMA Standard Decoder.**

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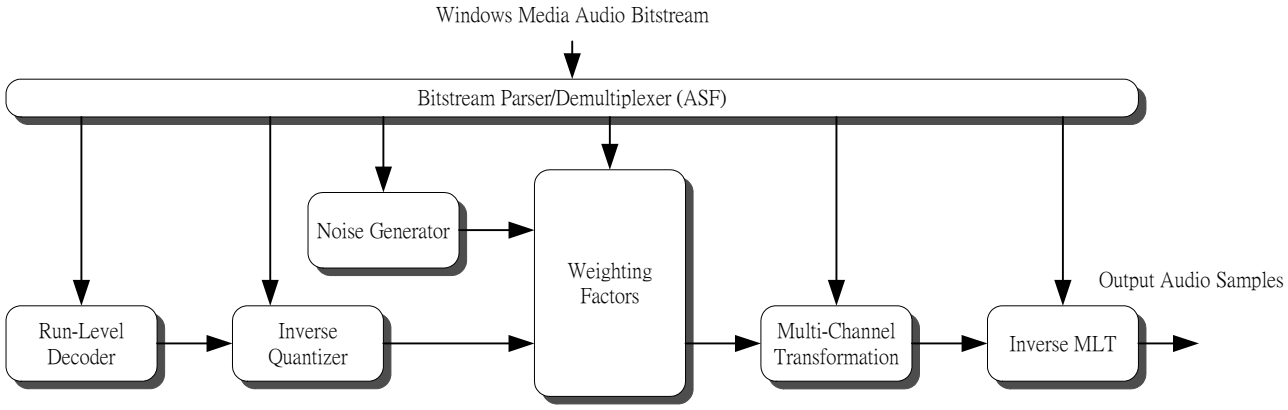
Block Diagram



WMA Standard Decoder block diagram

Description

The WMA Standard profile adopts the waveform coding concepts to achieve compressed performance. In decoding processes, the Advanced System Format (ASF) parser handles the bitstream. The run-level decoder decodes the spectral coefficients using inverse Huffman coding. The inverse quantization reconstructs the spectrum with the quantization step-size. The noise generator and weighting factors perform dithering operations in order to avoid artifacts from the encoding processes. The multi-channel transformation does sum-difference decoding. Lastly, the inverse modulated lapped transformation (IMLT) retrieves the time-domain samples by applying DCT-IV process.

To achieve the best audio quality for different encoding scenarios, the WMA Standard profile is subdivided into high-, mid-, and low-rate coding mode according to bit-rate and sampling rate. At high-rate mode, the noise generator and weighting factor are both disabled. At mid-rate mode, the noise information is included in the bitstream. At low-rate mode, the noise is generated by the LPC mechanism, which can effectively reduce the bitstream size.

Deliverables

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

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