

OAK TECHNOLOGY

FEATURES

- ◆ Decodes MPEG-1 audio (layer I or II) and video in real time
- ◆ Provides on-chip MPEG-1 system layer A/V demux and synchronization
- ◆ Provides CD-ROM decoding with both ECC/EDC
- ◆ Displays: 720x480 @ 30fps (N.I.) 720x240 @ 60fps (NTSC) 768x240 @ 60/50 fps (CD-I) 720x288 @ 50fps (PAL/SECAM)
- ◆ Host interface supports 8/16-bit ISA mode, and 8-bit microcontroller mode
- ◆ Direct interface to industry-standard CD-DSP and NTSC/PAL encoders, DRAM, and audio DACs
- ◆ Only 4 Mbits of DRAM are required for NTSC or PAL
- ◆ Horizontal and vertical interpolation using multiple-tap filters
- ◆ Oak's video interactive menu system - VIDSCAN™
- ◆ Supports IEEE P1180/D2 IDCT implementation for greater accuracy
- ◆ Power management mode
- ◆ 160-pin PQFP

DESCRIPTION

OTI-207

MPEG-1 Audio/Video Decoder

The OTI-207 is a highly integrated MPEG-1 decompression processor designed for VideoCD 2.0 specifications. Based on OTI-201, Oak's leading MPEG-1 decoder, and OTI-011, the world's most widely-used CD-ROM controller, this cost-effective solution incorporates MPEG-1 system, MPEG audio, MPEG video, and CD-ROM decoding onto a single chip.

A glueless interface to various CD-DSPs, audio DACs, and industry-standard NTSC/PAL video encoders reduces overall system cost. Additionally, support for several host bus protocols like the ISA bus, and Intel and Motorola microcontrollers is provided to increase overall system flexibility. The OTI-207 parses MPEG-1 system bit streams, decodes the audio and video, and supports real-time playback in SIF or CCIR 601 formats with horizontal and vertical interpolation. An integrated 32-bit RISC engine with internal RAM and ROM handles the decoding, audio/video synchronization, and error concealment.



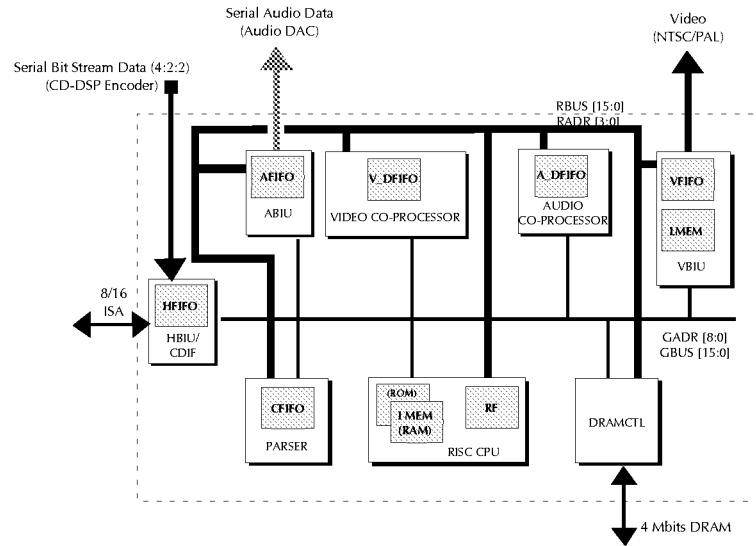
OTI-207 Product Brief

Architectural Overview/VideoCD Features

ARCHITECTURAL

The OTI-207 can be programmed to receive MPEG-1 system, MPEG video or MPEG audio data streams. System data streams are parsed using the internal 32-bit RISC engine. Once the data streams are parsed, the RISC CPU distributes the system, video, and audio data streams to the appropriate FIFOs for further decoding. For MPEG-1 video and audio streams, the RISC core redirects the signal to the video co-processor and audio co-processor for direct decoding. For CD-DA operation, the OTI-207 operates in pass-through mode, directly transferring data to the buffer of the audio unit.

OVERVIEW

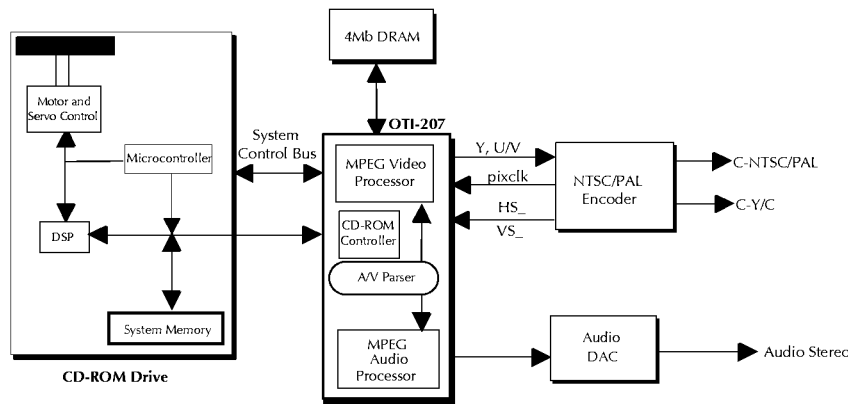


OTI-207 Block Diagram

VIDEOCD

For consumer electronics applications such as VideoCD players, the OTI-207's firmware and microcode support features like VIDSCAN and high-resolution stills. VIDSCAN is an interactive menu that allows users to simultaneously preview and choose from any VideoCD song/title selection. Oak's implementation of VIDSCAN enables video players to display a picture-based menu of up to 16 tracks for either VideoCD 1.1 or 2.0 disks. High-resolution stills can be utilized in slide show presentations as well as graphical chapter identification. Additionally, standard features such as Play, Pause, Fast Forward, Fast Reverse, Slow, Single Step Decoding, etc., can all be easily implemented.

FEATURES



OTI-207 VideoCD Player Architecture

HOST INTERFACE

The Host Bus Interface Unit (HBIU) directly communicates with the 8/16-bit ISA or 8-bit microcontroller bus for system control and data flow operations. The HBIU performs chip initialization, delivers compressed MPEG-1 data, reports internal operational status, and generates a system interrupt. The OTI-207's internal registers, counters, memory and DRAM are accessible through the HBIU.

DRAM INTERFACE

The primary function of the DRAM controller is DRAM address generation. The DRAM controller consists of a sophisticated memory access request mechanism to ensure sufficient DRAM bandwidth. The OTI-207's DRAM interface can support up to 2MB of DRAM data address. Only 4 Mbits (512 KBytes) of DRAM are required to decode MPEG-1 bit streams and display high-resolution still pictures.

CD-DSP INTERFACE

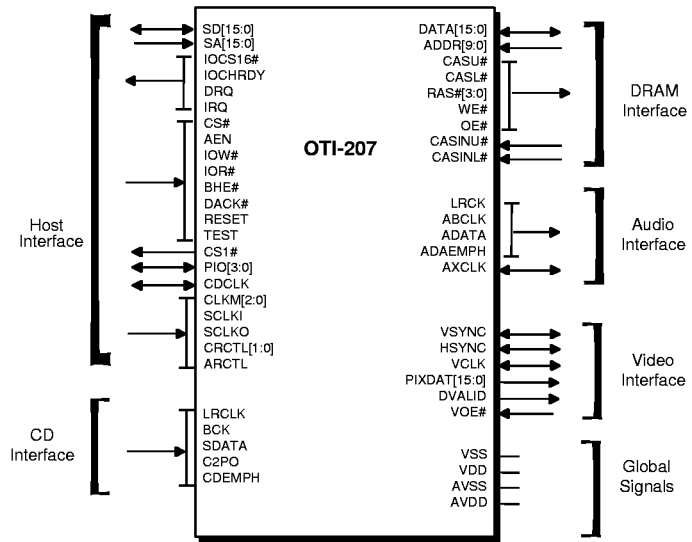
The CD-DSP unit provides a direct interface to receive the serial data output from the CD-DSP chip. The data stream coming from the CD-DSP can be CD-DA (audio PCM data), CD-ROM, or an MPEG-1 system stream (VideoCD, CD-I, or karaoke CD). The on-chip interface registers can be programmed to support different input formats so that many different CD-DSP chips can be supported.

VIDEO INTERFACE

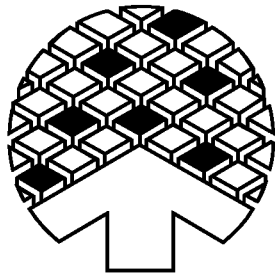
The OTI-207 output (uncompressed video pixel data) can be directed to an NTSC/PAL video encoder for video processing. Image quality is excellent due to a horizontal and vertical interpolation scheme that uses a 7-tap H-filter and a 2-tap V-filter. There are two types of video output modes supported: video slave mode and video master mode. Video slave mode is used in NTSC/PAL video applications, while video master mode is used in computer graphics overlay applications.

AUDIO INTERFACE

The OTI-207 provides reconstructed PCM audio samples in serial format directly to external audio DACs. The audio DAC interface is designed to be programmable so that most of the popular audio DACs can be used. It supports the following sampling frequencies: 32KHz, 44.1KHz, and 48KHz.



External Interface Signals



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