



M3321

MPEG-2 & Dolby Digital A/V Decoder

Product Brief

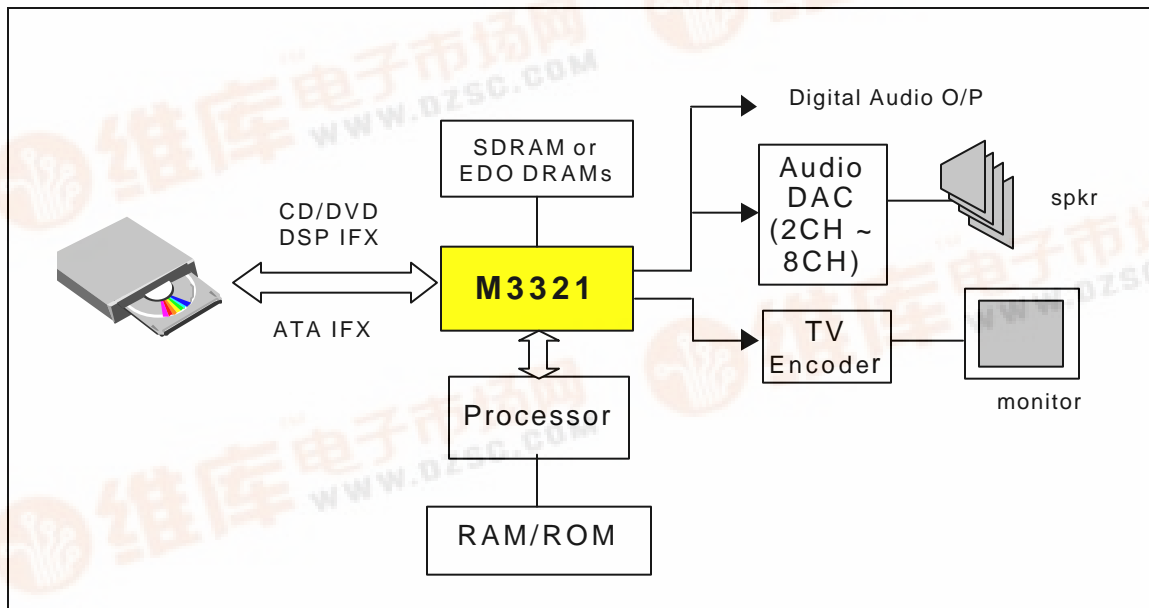
INTRODUCTION

The M3321 MPEG-2 and Dolby Digital Audio and Video Decoder Single Chip is another advanced IC from ALI that provides DVD A/V decoding for computers and consumer electronics. For computers, it supports different applications such as PCI bus, ZV port and local bus through VMI, AMC and VIP. For consumer electronics, it supports uP, CD/DVD DSP and ATA interfaces. The M3321 offers fast-forward, stop, freeze, frame-by-frame, slow motion and backward properties. Its audio properties has real time decoding of MPEG layer I/II/III Audio at sample rates 32K, 44.1K and 48KHz, and Dolby Digital. The M3321 supports PCM, Dolby Digital bitstream and DTS bitstream output via IEC 958. The audio post-processing of M3321 supports stereo enhancement and Virtual Surround for downmixed multi-channel audio source while using a 2-speaker environment. It supports 4 Mbits of 35 ns EDO DRAMs (256K x16 x1) for MPEG-1 decoding, 16/20/24 Mbits of 35ns EDO DRAMs (256K x16 x4/5/6) for MPEG-2 or 16/32 Mbits of 10/12ns SDRAMs (1M x16 x1/2) for MPEG-2 decoding.

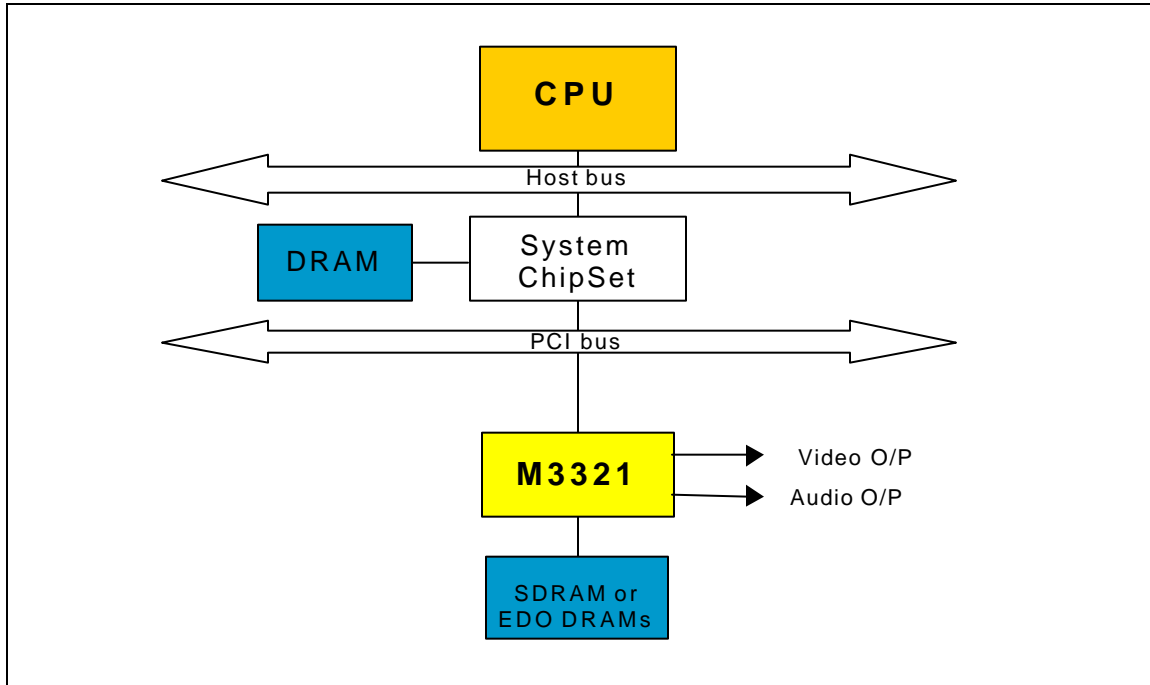
Furthermore, it uses a single 27 MHz external clock. This chip is packed in a 208-pin PQFP using 3.3V CMOS technology.

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M3321 System Diagram for Consumer Electronics



M3321 System Diagram for PCI Bus Architecture



FEATURES

- Integrated MPEG-2 & Dolby Digital audio/video decoders for DVD, STB applications
- Supports different Interfaces such as PCI, ZV Port and local bus without glue logic for PC application and uP, channel (CD/DVD-DSP, ATAPI) interface for Consumer application
- Supports DVD 1.1, Super VideoCD, VideoCD 1.0, 1.1 and 2.0, CD-I and CD-DA
- Supports complete firmwares such as DVD Navigator, Device driver, related I/O interface drivers (e.g. Audio DAC, TV encoder, UI devices, ATAPI Interface) for Consumer application
- Offers fast-forward, stop, freeze, frame-by-frame, slow-motion, backward playback
- Supports CCIR-601/656, AMC, VMI, VIP, ZV-Port video output format and sync in master/slave mode
- Supports PAL using only 16 Mbits of memory
- Supports ALi Dview™ (Video Digest) and Zoom function

MPEG System

- Built-in MPEG-1 System Stream and MPEG-2 Program Stream/ Packetized Elementary Stream Parser
- Supports DVD private packets such as PCI, DSI, Sub-picture, Dolby Digital, LPCM parsing
- CD/DVD-ROM format parsing
- Built-in hardware CSS for Authentication and Descrambling
- On-chip audio and video synchronization
- Automatic Error Concealment

MPEG Video

- MPEG-1, MPEG-2 Main-Profile @ Main-Level video decoding
- DVD Sub-Picture decoding and close captioning parsing
- 4/16 colors OSD (On Screen Display)
- Fully and simultaneously decodes DVD sub-picture, highlight and blending OSD
- Completely video post-processing functions such as aspect ratio and resolution conversion for Letterbox and Pan & Scan, frame rate conversion, frame/field conversion, chroma interpolation
- On chip video brightness, contrast, saturation adjustment and fade in/out control

MPEG Audio

- MPEG-1 layer I/II, MP3, Dolby Digital, DVD LPCM decoding
- Dolby Digital 5.1 channel audio decodes and downmixes simultaneously
- MPEG-2 multi-channel audio decoding supports 2-channel downmixed
- Supports DVD-Audio
- On chip programmable DSP for audio post-processing such as virtual surround, stereo enhancement
- Flexible audio output interface such as I²S DAC, IEC-958 (SP/DIF), PCI master
- Supports Dolby Digital and DTS bitstream on IEC958 output
- On-chip mute control and volume adjustment

Memory

- 4 Mbits of 35ns EDO DRAM (256K x 16 x 1) for VCD application only
- 16 Mbits of 35ns EDO DRAM (256K x 16 x 4) for DVD application
- 20 Mbits of 35ns EDO DRAM (256K x 16 x 5) for DVD application
- 24 Mbits of 35ns EDO DRAM (256K x 16 x 6) for DVD application
- 16 Mbits of 10, 12ns SDRAM (1M x 16 x 1) for DVD application
- 32 Mbits of 10, 12ns SDRAM (1M x 16 x 2) for DVD application

Physical

- 208-pin PQFP using 3.3V CMOS technology
- 3.3/5 V tolerance inputs
- Single 27 MHz operation clock

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