ZR36735

PRODUCT BRIEF

Vaddis IV*plus*™ INTEGRATED DVD DECODER

FEATURES

- Single Chip DVD Decoder Solution
- Full DTS™ Decoding
- MLP™ Decoding and Linear PCM for DVD-Audio Applications
- Multiple Standard Support: CVD, SuperVCD, VideoCD, DVCD
- Embedded NTSC/PAL Encoder w/ 10-bit Video DACs
- Integrated 54 MIPS Audio DSP
- Dolby Digital™, Pro Logic™, and MPEG 5.1 Audio Decoding
- Virtual Surround Sound, 3D Headphones, Music Modes
- Enhanced Karaoke
- Simultaneous 2 Channel, 6 Channel, and S/PDIF Audio Outputs
- Image Enhancement Filtering: Progressive Interpolation, Sharpening, and Brightness Equalization
- Advanced Trick Play Features including Zoom, Smooth Scan
- Enhanced On-Screen-Display with 32 Colors and 8 Blending Levels
- Functionally Compatible with Vaddis Family Decoders
- 176-pin TQFP Package
- 1.1 W Power Consumption in full operation
- 0.25 Micron Technology

DESCRIPTION

The ZR36735 Vaddis IV*plus* DVD decoder is targeted at fourth generation DVD and convergence products. With its high level of integration and flexibility, the Vaddis IV*plus* is a versatile digital video and audio processor. Full DTS decoding capability is integrated, thus eliminating the need for an external processing chip. In addition, the Vaddis IV*plus* is capable of decoding both MLP and Linear PCM (LPCM) streams for DVD-Audio applications, enabling cost-effective system design for full-featured DVD players. Other leading audio algorithms, such as HDCD, MP3, DTS, Dolby Digital, Pro Logic, and MPEG 5.1 decoding are also supported with this single chip solution. The video feature set has been expanded to include image quality enhancements and augmented On-Screen-Display (OSD) functionality. Through the StandardPlus™ design methodology, Zoran is building upon the standard to provide leading-edge capabilities for advanced DVD players and video appliances. The Vaddis IV*plus* is the ideal solution for DVD, WebDVD, Set Top Box (STB), Personal Video Recorder (PVR), DVD Recording, and Video-On-Demand products.

DVD Decoding

The Vaddis IV*plus* handles all aspects of decoding according to the DVD specification. This single chip solution performs DVD authentication/decryption, demultiplexing and parsing, MPEG-2 or MPEG-1 video decoding, sub-picture decoding, highlight processing, and audio/video synchronization. The integrated OSD unit provides 32 colors and 8 blending levels which are necessary for sophisticated on-screen user interfaces.

Highest Quality Audio

With its integrated 54 MIPS Audio Decode Processor (ADP unit), the Vaddis IV*plus* is capable of supporting the latest advanced audio algorithms. Based on Zoran's field proven audio DSP technology, the ADP unit is capable of full DTS decoding and MLP decoding for DVD-Audio applications. The quality of the output enables the development of a DVD system that meets the highest quality audio output standards, such as for Dolby certification. In addition, algorithms from our *SiliconSoftware*™ library are supported, including 3D Headphones and enhanced Karaoke.

KEY FEATURES

Image Enhancement Filters

The Vaddis IV*plus* incorporates several filtering functions for enhancing the image quality during normal and trick play operations. Progressive interpolation, sharpness and brightness equalization are implemented with these output filters. When using pause, fast forward, or fast reverse, the progressive interpolation filter provides a high quality image output, without displaying annoying artifacts. The Vaddis IV*plus* supports video edge enhancement and brightness control via programmable filter coefficients, giving it the flexibility to control the sharpness, intensity, and dynamic range of the image

On-chip Video Encoder and Video DACs

The Vaddis IV*plus* includes an advanced video encoder core capable of outputting YCrCb, RGB, CV, or S-video via four high quality 10-bit video DACs. The video encoder supports programmable chroma and notch filters to optimize the picture quality, even when displaying on lower quality TV's.

Multiple Standards

The Vaddis IV*plus* supports all of the key digital video and audio standards. Support for DVD, CVD, SuperVCD, VideoCD, DVCD, Audio CD, and MP3 is provided. SuperVCD is a popular digital video standard for the Asia market. Audio enhancements such as HDCD, 3D audio, Music Modes, and Karaoke expand the sound experience for the listener.

DTS Decoding and MPEG 5.1 Decoding

The Vaddis IV*plus* provides full DTS and MPEG5.1 audio stream decoding capability. All six DTS channels are available at the outputs of the Vaddis IV*plus,* enabling the design of a player that can fully decode the DTS data, without the need for an external audio processor. MPEG 5.1 output can be either through the S/PDIF or analog audio ports.

DVD-Audio Support

The Vaddis IV*plus* provides support for DVD-Audio with its integrated 54 MIPS ADP. The following formats can be supported with audio watermarking (required for industry copy protection systems) and post processing in the Vaddis IV*plus*:

- LPCM 6-channel (24-bit, 96 kHz)
- LPCM 2-channel (24-bit, 192 kHz)
- MLP 2-channel (24-bit, 192 kHz)

The Vaddis IV*plus* when integrated with Zoran's companion chip, ZR38601, enables the implementation of players that support 6-channel (24-bit, 96 kHz) MLP decoding with audio watermarking and post processing such as bass management and dynamic range control.

Compressed Audio

The recent explosion of applications for compressed audio has caused the popularization of standards such as MP3.

With the ability to play MP3 disks with a DVD hardware platform, new convergence applications are possible.

HDCD

HDCD is a technology that provides 20-bit resolution from standard Audio CDs. Widely available on many CDs today, HDCD expands the existing 16-bit data on an Audio CD to 20-bits, providing a higher quality audio output compared with typical Audio CDs.

Audio Enhancement Algorithms

Beyond the decoding of DVD or compressed audio, post-decoding algorithms such as Virtual Surround Sound, 3D Headphones, and Music Modes enhance the listening experience. Virtual Surround Sound gives the listener a multichannel effect through only two speakers. Likewise, 3D Headphones gives the sensation that the listener is surrounded by a theater speaker system, when the audio is actually delivered via the two speakers on the headphones. Music modes expand the sound of the room by simulating a theater or concert hall listening environment.

The Solution for the Consumer Market

The Vaddis IV*plus* is the leading solution for the consumer DVD market today. With its high level of integration and rich feature set, the Vaddis IV*plus* is a cost effective IC that delivers the versatility and performance demanded. As Zoran's fourth generation integrated DVD decoder, it has a mature, field-proven architecture. Enabling emerging applications such as WebDVD, Set Top Box (STB), Personal Video Recorder (PVR), DVD Recording, and Video-On-Demand, the Vaddis IV*plus* is *the* versatile digital video and audio decoder for consumer electronics products.

DVD Player Application using the Vaddis ZR36735