

ZR36748A Product Brief

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Benefits Overview

Zoran's Vaddis 5A (ZR36748A) DVD decoder is targeted at entry level automotive DVD products. The Vaddis 5A is built upon the Vaddis IV-LC back-end decoder and integrates a Turbo 186 CPU, a flash/ROM interface, an ATAPI interface, and several GPIOs for such tasks as front panel control and remote control input processing. This integration further reduces the system cost through component reduction and by minimizing PCB size. The ZR36748A includes progressive scan analog video output, support for DVD-RW, DVD-RAM, and DVD+RW playback, and WMA decoding. The component integration combined with the superior back-end functionality makes the ZR36748A the ideal choice for automotive DVD players.

TURBO 186 CPU, FLASH INTERFACE, ATAPI AND GPIOs

The traditional architecture of having separate CPU and back-end decoders is simplified by Vaddis 5A integration of both. The Turbo 186 CPU core architecture provides interrupt DMA & UART services, is superior in performance to a standard 186 processor, and supports execution of large programs. The system software is stored on

external flash or ROM and is accessed via the flash/ROM interface. Peripherals such as USB controllers can be connected to the flash/ROM interface for open-system designs. The ATAPI interface allows for a glueless connection to several drives, yet the Vaddis 5A still includes A/V and I²S interfaces for non-ATAPI solutions. The GPIOs can be used to control front panels, including inputs via remote control, or other devices per a system's needs.

MULTI-FUNCTION PLAYER

The Vaddis 5A contains the video and audio processing power to handle playback of all of the disc types listed in "Features". The Vaddis 5A is designed with Zoran's StandardsPlus™ methodology, which allows the device to support existing standards with some desirable enhancements including HDCDTM, MP3, JPEG, and WMA file playback. The programmable nature of the Vaddis 5A makes it ready for future standards and enhancements.

Features

- Supports: DVD-Video, DVD-RW, DVD-RAM, DVD+RW, CVD, SuperVCD, VideoCD, DVCD, Audio CD, Kodak PictureCD
- Dolby Digital, Pro Logic, Pro Logic II, DTS, MPEG 5.1, HDCD, WMA audio decoding
- ZoranZoom™ and panning
- Image Enhancement: sharpening and brightness for LCD display
- 8-channel and S/PDIF audio outputs
- Virtual Surround Sound, 3D Headphones, Music Modes
- Enhanced Karaoke
- Embedded NTSC/PAL encoder w/four 10-bit video DACs and Progressive Scan Output (PSO)

- Turbo 186 CPU
- On-Screen Display (OSD) processor with 32 colors and 8 blending levels
- ATAPI and A/V flexible drive interfaces
- Interfaces for front panel and IR remote I/O
- External Flash/ROM/Peripheral interfaces
- Supports 32-, 64- and 128-Mbit SDRAM configurations
- 208-pin PQFP package
- 1.2W power consumption in full operation

Features Description

STREAM PARSING

The Vaddis 5A can process sectors of the disc types listed previously. The bitstreams from these sectors are typically separated into video and audio for further processing, although other data types can be supported (e.g. VMGI, VTSI, sub-pictures). Included in this parsing is any necessary authentication and decryption (e.g. CSS) for DVD-Video, DVD-RW, DVD-RAM OR DVD+RW.

VIDEO DECODING

The Vaddis 5A enables video decoding of various MPEG formats and picture sizes supported by DVD, SuperVCD, CVD, VideoCD and DVCD. Frame rates and sizes can be converted between NTSC and PAL. JPEG decoding is supported to allow viewing of PictureCD and JPEG files.

AUDIO DECODING

The Vaddis 5A includes a 54 MIPS audio decode processor (ADP) capable of supporting the latest advanced audio algorithms including Dolby Digital, Dolby Pro Logic I/II, DTS, MPEG Layer II (including multi-channel), multi-channel LPCM, CD-DA, MP3, and Microsoft Windows Media Audio (WMA).

ZORANZOOM AND IMAGE ENHANCEMENT FILTERS

The Vaddis 5A incorporates ZoranZoom, Zoran's proprietary scaling algorithm and several filtering functions for enhancing the image quality. ZoranZoom™ is the built-in zoom and pan function which provides a crisp image for the resulting enlarged view. The Vaddis 5A supports user picture controls including sharpness (edge enhancement), and brightness adjustments to optimize the image quality of the LCD display that is placed in-dash or rear seat.

Integrated Automotive DVD Decoder

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Features Description (cont.)

OSD, SUB-PICTURE AND CLOSED-CAPTION INSERTION

The On-Screen Display (OSD) unit allows for overlay of custom graphics on the video. The OSD can be frame- or field-based with up to 32 colors and 8 blending levels. The Vaddis 5A supports sub-picture decoding with button highlighting and closed-caption insertion in the vertical blanking region.

Temperature Range

Characteristic	Range	Comments
Storage Temperature Range	-65 °C to +150 °C	Temperature range in which parts may be stored.
Full Specification Range	-20 °C to +80 °C	Full operation in this temperature range with performance within the component specification.
Operational Range	-30 °C to -20 °C; +80 °C to +85 °C	Operation in the temperature range with the possibility of degraded characteristics, but without catastrophic failure.

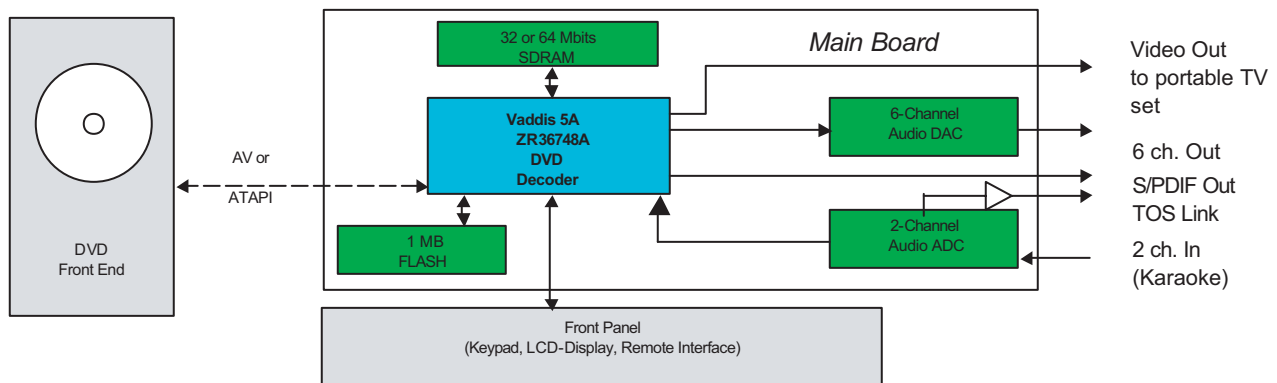
ANALOG VIDEO OUTPUT WITH PROGRESSIVE SCAN

The Vaddis 5A includes an advanced video encoder core capable of outputting YPbPr, RGB, Composite, or S-Video via four high-quality 54MHz 10-bit video DACs. The video encoder supports programmable chroma and notch filters to optimize the picture quality, even when displaying on lower quality TVs. The encoder also supports progressive scan video output, with multi-angle video processing for excellent progressive scan image quality.

AUDIO ENHANCEMENT ALGORITHMS

Beyond the decoding of DVD or compressed audio, post-decoding algorithms from Zoran's SiliconSoftware® library can be applied to enhance the listening experience. Such algorithms include Virtual Surround Sound, 3D Headphones, Graphic Equalization, Karaoke and Music Modes. Virtual Surround Sound gives the listener a multi-channel 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. Graphic Equalization allows the listener to amplify or attenuate various frequency bands of the audio. Karaoke allows mixing of digitized microphone(s) input with playback of the audio with audio effects applied such as echo, voice cancellation and key shift. Music modes expand the sound of the room by simulating a theater or concert hall listening environment. In addition to these algorithms, bass redirection and multi-channel downmixing are supported for all of the various audio standards.

Automotive DVD Player Application Using the Vaddis ZR36748A



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