

## Mediamatics™ NDV8401 DVD on a Chip Processor

### Platform

The Mediamatics™ NDV8401 DVD on a Chip Processor provides features and cost effective system integration for Universal DVD Players and Internet connected Players/Recorders. Integration of an industry standard RISC processor architecture operating at high performance levels allows system developers to combine the ease of C based application coding with flexible system extensions unavailable in other platforms. This processor can be equally applied to DVD-Video & DVD-Audio playback and Internet Appliance products.

quality and flexibility with wide ranging support for all common disc-based audio formats and many Internet based formats. A custom 24-bit DSP has been developed to provide a powerful solution for the latest compute intensive audio algorithms. Support includes DVD-Video, VideoCD and CD formats. The flexible audio structure allows audio data to originate from disc-based media, external digital audio streams or via the Internet. Full 5.1 channel output with simultaneous 2-channel down-mix and IEC958/1937 output is standard for the NDV8401.

### Audio

The NDV8401 provides unsurpassed audio processing

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### Features

The NDV8401 is a “system on silicon” solution for consumer DVD Players. Significant feature enhancements are being provided on this version of the NDV8401 device to address both full-featured DVD-Players and DVD-R/W Recorder/Player products.

#### System Solution

- Designed for DVD Players with the capability to play DVD-Video, DVD-Audio, VideoCD 2.0, CD-DA, CD-DA in DTS format, and CD-DA with CD-TEXT content
- Unified Memory Architecture (UMA) allows sharing of single memory pool for instruction fetch, execution space, system stream demux, video decode, audio decode, video display and audio presentation
- Primary clock operating frequency range between 80 – 100MHz based on feature/power requirements
- Three on-chip PLLs/Frequency Synthesizers which can generate all required system clocks
- Design optimized for 16Mbit & 64Mbit SDRAM operation
- Flexible host bus, communication ports & DVD Front-End control to support all DVD system elements

#### Integrated RISC Processor

- 32-bit processor with an operating frequency of 67.5 MHz
- 2KB instruction cache
- 1KB data cache
- 1KB local RAM

#### DVD Front End Interface

- Supports DVD format, Video CD 2.0 (White Book), & CD-DA (Red Book)
- Real time error detection & correction
- Supports serial data input with sync search, descrambling, EDC, & serial to parallel formatting blocks
- Supports 8-bit parallel data input with selectable bypass of the internal Front End processing blocks
- Integrated CSS decryption/descrambling for DVD content

#### MPEG Transport Engine

- Accepts input from front end at up to 40Mbps+
- Program Stream demultiplexing
- Sub-stream header parsing for DVD

#### MPEG Video Decode

- Decodes MPEG1 video & MPEG2 main level, main profile video (720x576)
- Maximum input bit-rate of 15 Mbits/sec

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### **MPEG & Dolby Audio**

- Custom DSP design optimized for processing of DVD audio formats
- Provides 6 channel PCM outputs + simultaneous 2 channel stereo downmixed PCM outputs
- Decodes MPEG1 & 2 stereo formats
- Decodes Dolby Digital (Dolby AC-3) audio up to 5.1 channels
- Audio down sampling option for Dolby Digital
- support for all DVD PCM audio formats including 96KHz sampling rate
- Flexible interface for multiple audio DACs for 16/18/20/24 bit formats
- Integrated SPDIF encoding capability for both IEC958 & IEC1937 formats
- Support for MPEG-2 multi-channel extensions & DTS encoded material via SPDIF output
- Simultaneous SPDIF output with analog DAC output
- Integrated Karaoke audio capture port & digital mixing
- Audio Frequency Synthesizer to support multiple audio sampling rates for AudioCD, VideoCD, & DVD

### **Video/Graphics Processor**

- 2-tap vertical filter/scaler, 8-tap horizontal filter/scaler for MPEG-1 scaling & sinx/x DAC upsampling
- YUV 4:2:0 input format with vertical filter for chroma conversion to 4:4:4
- Pan & Scan for 16:9 to 4:3 output conversion & pass-through letterbox
- Sub-Picture decoder with Alpha Blending for DVD SPUs
- 2/4/8 bit full screen OSD functions with alpha blending for flexible graphics display
- Up to 8 regions per line
- Closed caption support

### **NTSC/PAL Encoder**

- NTSC-M, PAL-M/B/D/G/H/I
- Composite, S-Video & YCrCb component video outputs
- Teletext encoder with sequencer & filter
- Wide Screen Signalling in encoder for PAL formats
- Copy Generation Management System in NTSC/PAL encoder for both NTSC & PAL formats
- 4 field NTSC or 8 field PAL generation
- Luminance Filtering with 2x oversampling and sinx/x correction
- Chrominance Filtering with 4 times oversampling
- 3 10-bit DACs
- Macrovision Copy Protection Version 7.01

### **Communication Ports**

- Flexible serial port communication combinations
- 2 integrated USARTs
- 2 integrated Synchronous Serial Ports
- Sharing of pins via 3 different modes that allow designer to choose the configuration of serial ports
- Integrated Consumer Infrared demodulator in one UART

### **Design for Test**

- Full scan methodology

### **Low cost manufacturing**

- 3.3V, 0.35?, 4-layer metal single polycide standard cell National Semiconductor technology
- 208 pin MQUAD package

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