Any Content Anywhere™

DXT System Key Benefits

- **Full Re-encode Transcoder Architecture delivers highest vector quantization (VQ).**
- **Full tool-set applied to optimize VQ for the available bandwidth.**
- **Mode-decisions do not carry forward when Transcoder bit-rates diverge > 5-10%.**
- **Per-pixel adaptive Processing / Filtering between Decode and Encode.**
- **Broadest compatibility – MP2, AVC, VC1; AC3, AACHE/LC, MPEG L1/L2, WMA.**
- **Glitch free Bit-rate, Frame-rate, H or V Resolution change.**
- **¼ and ½ pel support for widest range of players.**
- **Low Latency Channel Change.**
- **Full decode and re-encode programmable architecture that produces quality video at lower bit rates.**
- **Programmable, self-adaptive algorithms that are imperative for content redistribution over links with fluctuating transmission bandwidth.**
- **Flexible unified multi-core architecture.**
- **Adoption by Tier-1 OEMs, starting CES.**

Features

- **Multi-Format H.264/VC-1/MPEG-2 HD/SD Transcoder Coprocessor for Blu-ray Recorder, DVD Recorder, and DVR applications.**
- **HD/SD Low-power Transcodec for USB dongle applications.**
- **Ability to transcode HD and SD content in a system that runs completely on USB bus power.**
- **Nitro2 HD MPEG2 to H.264 Transcoding (DXT-Turbo).**

Magnum DXT Coprocessor Family:
DXT-Turbo, DXT, DXT-LP

Overview

The Magnum DXT Product Family provides multi-stream high-definition media processing solution for consumer and professional applications. It provides a single platform for all segments of the living room clients' chain, including Blue-Ray DVD recorders, cable, satellite, and IPTV set-top boxes and DVRs.

The DXT family product utilizes an embedded programmable multi-standard, multi-format, and multi-resolution media processor that is capable of encoding, decoding and transcoding high-definition audio and video compression formats, including MPEG1/2/4-ASP, DivX, H.264, and VC-1.

Also available are a number of audio and video interfaces, compressed media interfaces, memory interfaces, and data interfaces, as well as a powerful MIPS 24Kc.

In addition, a number of security features are available to protect the device and its contents.

The DXT system's functional blocks are shown below:

DXT System Components

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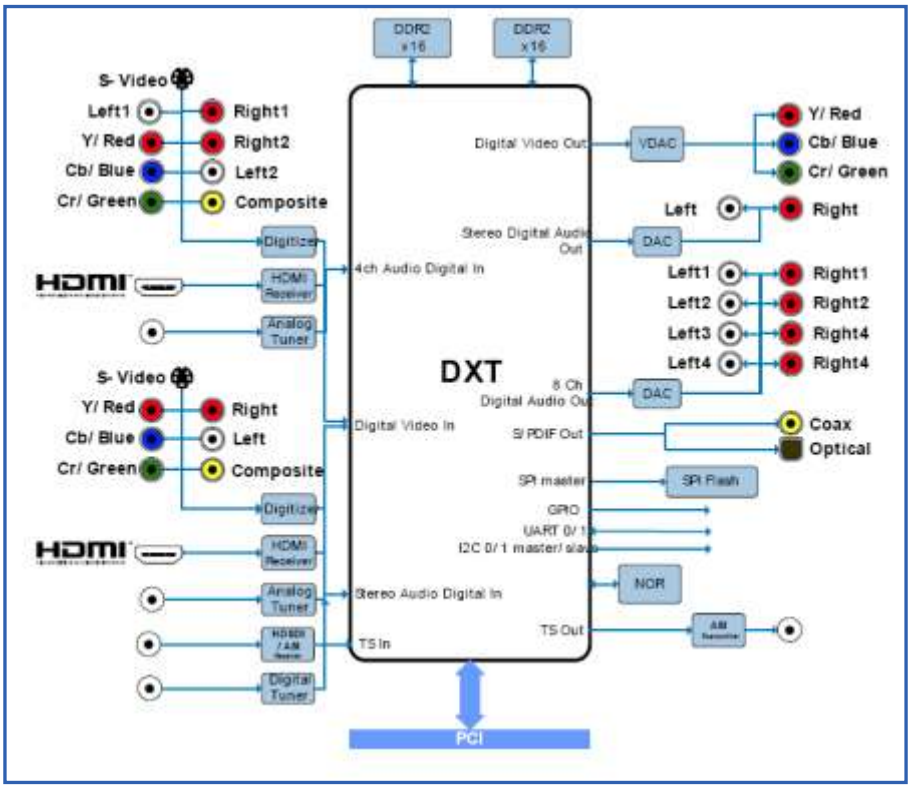
http://www.agnumsemi.com

The following figure shows the DXT system's main external components, including the audio and video, compressed media, memory, and data interfaces:



DXT System External Components

DXT Product Family

The DXT co-processors enable a host of novel time-shifting, place-shifting, and device-shifting features in set-top box and home media server appliances. They enable longer recording in set-top DVR and whole home DVR applications through transcoding from MPEG-2 to H.264 in HD or SD resolutions. They enable content on-the-go applications through transcoding of MPEG-2 to H.264 or VC-1 and through transiting down to QCIF for mobile devices, such as smart phones and laptops. Additionally, the DXT coprocessors enable robust place-shifting applications, not just through transcoding, but also through efficient rate-shaping.

The DXT co-processor family consists of DXT-Turbo, DXT, and DXT-LP coprocessors, as described below:

DXT-Turbo Applications	Video Capabilities	Audio Capabilities	Security Capabilities
Provides the highest performance along with full HD H.264 transiting with mirror.	Full HD MP2 to H.264 Full HD H.264 to H.264 Mirror Transcoding	AC3, AACHE, MPEG L1/2 (5.1Ch) to AAC LC or WMA (2Ch) 5.1 Ch Pass-through	Security Processor 32K OTP (Trusted Boot/Keys) HW Ciphers (AES/DES) DRAM Encryption Unique ID

DXT Applications	Video Capabilities	Audio Capabilities	Security Capabilities
Is low cost, provides 275Mhz Core / 400Mhz DDR2.	Full HD MP2 to H.264 Full HD H.264 to H.264 (1440) No Mirror	AC3, AACHE, MPEG L1/2 (5.1Ch) to AAC LC or WMA (2Ch) 5.1 Ch Pass-through	Security Processor 32K OTP (Trusted Boot/Keys) HW Ciphers (AES/DES) DRAM Encryption, Unique ID

DXT-LP Applications	Video Capabilities	Audio Capabilities	Security Capabilities
Is low power, suitable for USB dongle applications. Provides 275MHz Core / 333MHz DDR2.	Full HD MP2 to H.264 (1440) Full HD H.264 to H.264 (1440) No Mirror	AC3, AACHE, MPEG L1/2 (5.1Ch) to AAC LC or WMA (2Ch) 5.1 ch Pass-through	Security Processor 32K OTP (Trusted Boot/Keys) HW Ciphers (AES/DES) DRAM Encryption, Unique ID

Media Processor

The media processor enables decoding two high-definition video streams, including MPEG-2 MP@HL HP@HL, VC-1 AP@HL, H.264 HP/L4.2, MPEG-4p2 ASP/L3 with 1/4 pel and GMC, or DV25/50. It is capable of decoding a single 1080p60 stream.
The media processor can encode a raw high definition 1080i60 video stream to either MPEG-2, VC-1, or H.264. Additionally, it is capable of transcoding a high definition video stream to another high definition compressed format and can provide a simultaneous standard definition mirror transcode of the same stream. All source and destination formats are supported by the software controlled codec.

Video Processor

The video processing module provides high quality, de-interlacing, noise reduction, and scaling.

- Scaling
- Motion Compensated Temporal Filter (MCTF)
- Mosquito noise reduction
- Block noise reduction
- Mixed cadence detection and handling

Audio Processor

Audio processing is performed on a high performance MIPS24Kc running up to 400MHz.

Security and Conditional Access

- Trusted Boot
  DXT provides a 32 kByte one-time programmable (OTP) memory to enable trusted boot and key storage. An elliptical curve and a hashing unit allow authentication of code before execution. Secure communication is enabled by a true random number generator (TRNG). DRAM encryption prevents unauthorized access to memory**.**
- Ciphers
  - The symmetric cipher unit provides acceleration for the following ciphers with full mode support of ECB, CBC, OFB, CFB, CNT as applicable:
  - AES128 (memory to memory only)
  - DVBCSA v2 (Only in Transport Stream IP)
  - SHA1/2
  - Multi2 (Only in Transport Stream IP)
  - M6
  - DES (Also available in Transport Stream IP)
  - 3DES (memory-to-memory only)

Smart Card

An ISO 7816 compatible smart-card interface is provided to enable access to secure smart cards

DXT System Interfaces

The DXT family supports the following interfaces:

Flexible SOC Interface options

- PCI
- Host Interface
- TSin/TSout
- USB (via Cypress EZ-FX)
- Embedded or UART/I^2C Commands
-

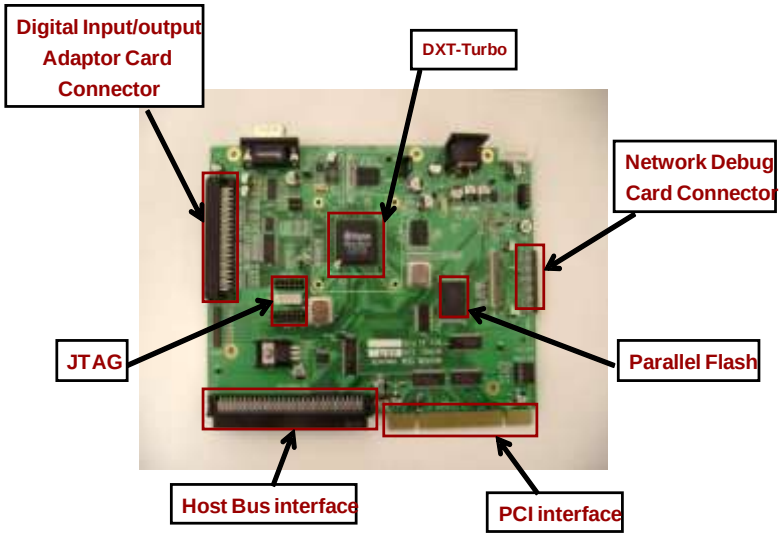
DDR2 2 x16 400MHz interface

Encode, Decode or Transcode Input/Output

- 2 x8 or 1 x16 Video In
- 2 x8 or 1 x16 Video Out
- 2 xI2S input; 8x I^2S Out

DXT Reference Platforms

DXT-Turbo/DXT Nitro Reference Platform



PCI or Host Bus-based HD Transcoder

Target Host Platform

- Linux PC/Embedded System

PCI Interface Mode

- TS in/out on PCI
- Microcode through PCI
- Command through PCI

Host Interface Mode

- Microcode and Command interface
- TS in Serial Port
- TS out Serial Port

Standalone Mode

- Evaluation using ASI in and out

DXT-LP Plankton Reference Platform

USB Bus Powered HD Transcoder System

- 2250mW total solution Power

Target Host Platform

- Window or MAC PC
- Linux/CE STB

Key Applications

- Place Shifting—Convert Broadcast content to VC-1 or H.264 for place-shifting.
- Mobile Content Creation—Create content compatible to PSP, iPOD and iPhone.
- Save HDD Save—Transcode HD MPEG2 content to HD H.264 to save Storage Space

Ordering Information

Use the following table to order different DXT device configuratiuons:

DXT Device Configuration	Part Number
High-VQ Multi-standard High-Performance Transcodec CoProcessor	DX2261-TBG
Multi-standard HD/SD Transcodec CoProcessor	DX2261-CBG
Multi-standard HD/SD Codec CoProcessor	DX2265-CBG
High-VQ Multi-standard Transcodec / Codec CoProcessor	DX6215-TBG
Multi-standard 2 Ch SD Codec CoProcessor	DX2262-CBG
Multi-tandard transcoder/encoder CoProcessor	DX6215-CBG
Low-power Multi-standard low-power transcoder CoProcessor	DX6225-LBG
Multi-standard HD/SD Transcoder CoProcessor	DX6225-CBG
Multi-standard HD/SD Decoder CoProcessor	DX2266-CBG