



XCodeHD™– 3390 is a High Performance AVC/MPEG2/4 Transcoder, Encoder, and Decoder

- ◇ AVC/MPEG2 Dual HD Decoding
- ◇ AVC/MPEG2 HD encoding
- ◇ Transcoding:
  - AVC, MPEG2
  - HD to HD/SD
- ◇ 400 MHz Host CPU
  - Up to 1000 DMIPS
- ◇ Dual Ethernet, Dual USB, Dual SATA, PCI v2.3, PCI Express
- ◇ Transport stream Input for ATSC, DVB, and ISDB support
- ◇ DVB-CI, Multi/Single CableCard™ and Smart Card interfaces
- ◇ Support for worldwide Conditional Access and Content Protection schemes

## FEATURE SUMMARY

### *Video Decoding/2D Graphics*

- ◇ Dual MPEG/AVC HD Decode
  - MPEG2: MP@HL
  - AVC: High Profile up to Level 4.1
- ◇ Multi-channel Audio Decoder
- ◇ Accelerated Bitblt and Colour Fill
- ◇ 32-bit OSD
- ◇ Text and Graphics up to HD resolution

### *MPEGPerfection™ Encoding*

- ◇ AVC HD High Profile up to level 4.1
  - ¼ pixel resolution
  - Full Interlace support – MBAFF
  - Entropy Coding – CABAC/CAVLC
- ◇ MPEG2 up to HD (MP@HL)
- ◇ MPEG4 up to D1 (with PSP, iPOD, DivX™ remix)
  - ASP (L0 – L5)
  - SP (L0 – L3)
- ◇ 525/60 NTSC, 625/50 PAL
- ◇ VBR or CBR encoding
- ◇ Programmable GOP structure
- ◇ 4:2:2 to 4:2:0 conversion
- ◇ Inverse telecine (3:2 pulldown)
- ◇ Scene change detection

### *Programmable Audio Processing*

- ◇ MPEG2 LI, LII, MP3
- ◇ MPEG2 AAC-LC-Stereo
- ◇ Dolby AC-3 True HD, 7.1, 5.1, Stereo
- ◇ DTS HD, 5.1
- ◇ WMA
- ◇ AMR
- ◇ aacPLUS
- ◇ PCM
- ◇ Others

### *Smart XCode™ Transcoding/Transrating*

- ◇ Format conversion of multiple streams (SD/HD):
  - AVC >> MPEG2, MPEG4 (ASP, SP), AVC
  - MPEG2 >> AVC, MPEG2, MPEG4 (ASP, SP)
- ◇ Bit-rate reduction of multiple streams:
  - 40 Mbps >> 64 Kbps
- ◇ Resolution reduction of streams:
  - HDTV >> HDTV >> SDTV >> CIF >> QCIF
- ◇ High-speed video processing 2X – 12X real-time

### *Stream Formats Supported (In/Out)*

- ◇ Elementary Stream (ES), Packetized Elementary Stream (PES), Program Stream, Transport Stream (TS)
- ◇ YUV in/out stream support via PCI

## INTERFACES

- ◇ 2x 10/100 Ethernet MAC, 2x USB 2.0 Host/Peripheral, 2x SATA Controller, 4x UART
- ◇ Integrated NAND Flash Controller
- ◇ Transport stream inputs (up to 2 serial)
- ◇ Transport stream output
  - i. Re-multiplexor
- ◇ DVB-CI, Cablecard controllers
- ◇ Dual Smart Card interface
- ◇ DDR2 SDRAM memory controller
- ◇ PCI v2.3 32-bit 33 MHz bus, PCI Express
- ◇ YCrCb SMPTE 274/296 Output, 5x I<sup>2</sup>S Output
- ◇ 2 x I<sup>2</sup>C – master & master/slave
- ◇ 2 x 8/10 bit CCIR 656 input or 1x YCrCb input SMPTE (274/296)
- ◇ 1 x I<sup>2</sup>S inputs
- ◇ SPDIF In/Out
- ◇ General Purpose I/O

## SECURITY FEATURES

- ◇ Supports capture and descrambling of ATSC, DVB, and ISDB-T protected standards
- ◇ Supports DVB/DES/3DES/Multi2/3DES descrambling
- ◇ Supports multiple digital right management schemes i.e. MSDRM, RealNetworks, DTCP/IP etc. with a powerful encryption/decryption engine

## TECHNOLOGY

- ◇ Efficient Low Power Design
- ◇ 90 nm CMOS design
- ◇ 31mm x 31mm BGA package

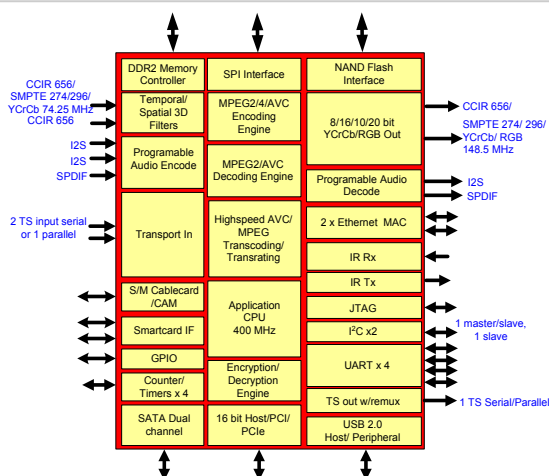
## TYPICAL APPLICATIONS

- ◇ IPTV, Cable, and Satellite Set-Top boxes
- ◇ Personal Video Recorders (PVR's)
- ◇ DTV, PVR DTV
- ◇ Blu Ray Recorder/Player
- ◇ DTV PVR
- ◇ Residential / Home Gateways
- ◇ Video NAS

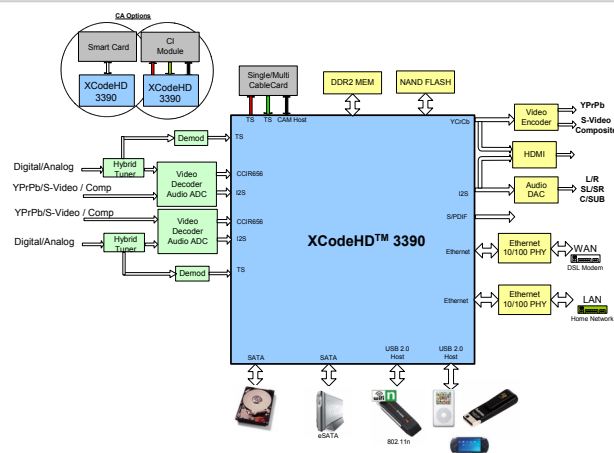
## CORE TECHNOLOGIES

- ◇ Smart XCode™ technology allows users to convert formats, resolution, and frame rates of pre-compressed video, up to 12X faster than real-time, to fit video to many viewing devices
- ◇ MPEGPerfection™ technology defining low-bitrate HD compression without compromising video quality

## XCodeHD™ 3390 BLOCK DIAGRAM



## PVR Set-Top Box



**ViXS Systems, Inc.**  
 1210 Sheppard Ave East, Suite 800  
 Toronto, ON, Canada, M2K 1E3

Phone: (416) 646-2000  
 Fax: (416) 646-1042  
 Web: [www.vixs.com](http://www.vixs.com)