



CAST

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CAST Offers a Broad Line of IP Cores

Processors

8-bit: 8051 configurable, Z80
 16-bit: 68000, 80186tx
 16- and 24-bit DSPs
 32-bit 68000 AHB

Memory & Peripherals

Device Controllers
 Smart Card
 Reader,
 TV Display, VGA
 Display
 Memory Controllers
 DDR1/2 SDRAM
 SDR mobile
 SDRAM
 NAND flash
 Storage Controllers
 ATA/IDE Interface
 Gen. Purpose I/O
 Unit

Multimedia

JPEG, Lossless
 JPEG-LS
 JPEG 2000
 H.264 (MPEG-4)
 Audio: I2S, SPDIF
 Image Conversion

Encryption

AES
 DES, Triple DES
 MD5
 SHA-1, SHA-256

Communication

s
 Consumer IR
 Controllers
 Synchronous UARTS
 SDLC

Interfaces

PCI & PCI Express
 MACs
 FireWire
 USB & OTG
 CAN, LIN, I2C,
 SPI

SOC & Kernels

Essential HW & SW
 built around a
 processor
 APS

Replacements

Processors, Bit Slices
 Controllers
 Peripherals, Timers,
 UARTs
 Z80 Support
 TTL Parts



The Compression IP Family from CAST

- **JPEG-E, JPEG-D**
 - An older standard that is still viable for still images
- **LJPEG-E, LJPEG-D**
 - Lossless JPEG
- **JPEG-LS-E**
 - HP lossless JPEG algorithm
 - Best lossless compression algorithm
- **JPEG2000-E**
 - Stores multiple resolution levels
 - Good for surveillance and medical imaging applications
- **H264-E Video compression**
 - Is replacing MPEG4



Decisions Regarding Algorithm Choice

- Desired Compression
- Input format
- Desired output
- Algorithm choice trade-offs
- System requirements
- Evaluation

Desired Compression

Lossless, near-lossless or lossy compression?

- Lossless:
 - LJPEG
 - JPEG-LS
 - JPEG2000
- Near-lossless: numerically lossless and visually lossless
 - LJPEG
 - JPEG-LS
 - JPEG2000
- Lossy
 - JPEG
 - JPEG2000
 - H264



Algorithm Choice Trade-Offs

- Area
- Speed
- Memory requirement

System Requirements

- Latency
 - Rate control
- Compressed images must be transmitted over a limited bandwidth transmission channel
- Error Resilience
 - CPU required?
 - Memory Interface

Evaluation

- Bit Accurate Model
 - A System C model that behaves identically to the IP core. Input is the same stream as to the IP core, output is identical to the compressed output of the IP core.
- Prototype board
 - Board available for JPEG2000 and H264. Evaluations available for JPEG, LJPEG and JPEG-LS
- References in your market sector
 - Military is not always obtainable
- Synthesis results for area and max operating frequency
- Access to compression engineering expertise



CAST

Thank you

- Explore CAST IP at ChipEstimate.com
- Use CAST IP to plan your next chip!
- Please stay and talk with Meredith

