



H.264-15 (1.5 Clocks/Pixel) Encoder FPGA CORE

General Description

A2e continues to improve on its industry leading H.264 core with enhancements that significantly reduce the compressed bit rate while maintaining the same image quality. Compressed bit rate has been reduced by up to 50% for low motion surveillance type video and up to 20% in videos with significant motion. The A2e H.264 Encoder is still the smallest and fastest FPGA core in the industry at 1.5 clks/pixel and 22,000 LUTs. A single core is capable of compressing 1080p30 video in a Igloo 2 device. A complete IP camera can now be created in a single, low-cost SmartFusion 2 SoC device!

The H.264-15 supports H.264 variable and fixed bit-rate encoding of video streams. Multiple cores can be used for processing larger size or higher bandwidth images.

Features

- 1.5 clocks/pixel processing rate
- Supports resolutions up to 4096 x 4096 (can be expanded with additional cores)
- Supports simultaneous encoding of multiple streams of arbitrary sizes and compression ratios
- Generates I and P frames
- Variable Bit Rate (VBR) and Constant Bit Rate (CBR)
- Search range: 80 x 48 pixels, Full, ½, ¼ pixel resolution
- Entropy Encoding: CAVLC
- Support for intra 4 x 4 DC prediction
- Support for single or multiple slices via firmware control
- Supports YUV 4:2:0 video input
- Fully synchronous design

H.264 Feature Set

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- Supports H.264 Baseline profile
- Fully compliant with the H.264 specification for encode. Decode only works with A2e encoder.
- Both VBR & CBR rate control (CBR is software controlled by uP) are supported.
- The core's motion detection pixel search area and resolution are:
 - Search Range: 80 x 48 pixels
 - Motion Vectors: +/- 32 in horizontal, +/- 16 in vertical
 - ¼ pixel resolution
- The following additional H.264 features are implemented in the core:
 - Fixed 16 x 16 block size
 - Multiple slices
 - Progressive mode

Licensing

- Available as an encrypted netlist
- Project specific and unlimited site licenses available

Performance

- 1080p30 in Igloo 2-1
- Maximum number of simultaneous input streams only limited by total core throughput.
- 1 frame latency regardless of frame rate.

Deliverables

- Encrypted netlist
- C Model:
 - H.264 C-Model with supporting applications and documentation
 - H.264 C-Model GUI for easy use of C-Model
- Linux drivers & documentation:
 - Linux Encode/Decode driver source code
 - Linux Driver Owner's Manual
- H.264 Core Owner's Manual
- Simulation Files
 - Verilog Testbench with Tcl scripts and supporting files
 - Encrypted H.264 RTL core compatible with ModelSim
- SmartFusion 2 Eval Board:
 - SmartFusion 2 SoC based reference design
 - PC based control GUI for reference design

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Supported Devices

- SmartFusion 2
- Igloo 2

Resource Consumption

	Igloo 2 050-1
LUT	22,600
LSRAM	47
uSRAM	38
Clock Frequency	93MHz

Please Contact Us

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