

CAST Releases MPEG-4 and JPEG 2000 IP Cores

*Fast, small, flexible cores facilitate use of advanced standards
for high-quality video and image processing applications*

January 27, Santa Clara, California — Semiconductor intellectual property (IP) provider CAST, Inc. today announced the addition of new MPEG-4 video encoding and JPEG 2000 image decoding cores to its line of general purpose IP (gpIP) for electronic design.

The CAST MPEG-4 core offers vastly greater performance than software-based solutions, and provides broader features and capabilities than other MPEG-4 cores. It is small and fast — easily handling real-time encoding of full-screen video in under 50,000 ASIC gates — and has the flexibility to support a range of applications from high-quality video conferencing to remote streaming of DVD-quality movies.

The CAST JPEG2K_D core provides complete hardware acceleration of the new JPEG 2000 image processing standard. It decompresses images at competitive rates, decoding a 5 megapixel camera image in half a second, or standard definition TV (720 x 480 pixels) at 30 frames per second. The core is also quite flexible, with implementation options and programmability features that make it easy to tailor its processing abilities, size, and power consumption to specific devices, applications, and systems.

Available immediately for synthesis to ASICs or optimized for various FPGAs, the new cores join CAST's substantial library of multimedia IP. This includes complete solutions such as JPEG 2000 encoding as well as individual multimedia subsystem cores for motion processing and estimation, discrete cosine (DCT) and waveform (DWT) transformations, color space conversion, and Huffman processing. Designers should see the web site for full information (www.cast-inc.com).

About the CAST MPEG-4 Core

The MPEG-4 standard was designed to provide scalable, high-quality video on a variety of display devices and over any transmission technologies. The CAST MPEG-4 core provides the best available implementation of this philosophy, offering greater capabilities, higher performance, and competitive implementation efficiencies compared with other cores.

The ISO/IEC 14496 MPEG-4 Standard defines ranges of capabilities categorized into profiles and levels. The MPEG-4 cores from other vendors are primarily targeted at mobile video applications; they provide the lowest class of support — MPEG Simple Profile Levels 0 to 3 — which allows for images up to 352 pixels by 288 lines at 30 frames per second. The CAST MPEG-4 core supports these low resolutions and more, satisfying MPEG Advanced Simple Profile Levels 0 to 5 and handling as large as 704 x 576 at the same 30 fps rate. This higher degree of MPEG-4 support also enables more sophisticated video features, and makes it possible to gain MPEG-4 advantages for applications like digital video recorders or remote camera systems where larger, high-quality video streams are required.

Moreover, the CAST MPEG-4 core yields a very efficient hardware implementation, requiring fewer than 40,000 gates in a reference ASIC or fitting in smaller FPGAs (plus memory; see table). It also operates efficiently, requiring a clock rate of just eight times the raw pixel rate. This means the operating rate needed for videoconferencing (176 x 144 screen at 15 fps) is just 3 Mhz, and for VGA video (640 x 480 at 30 fps) just 74 Mhz.

<u>Technology</u>	<u>Approx. Area</u>	<u>Frequency</u>	<u>Video Throughput</u>
ASIC 0.18 μ process	39K gates and 25 Kbits RAM	~ 100 Mhz	> 704 x 576 (4CIF) frames at 30 fps
Xilinx Virtex II	3,600 slices and 10 Multipliers and 16 RAM blocks	> 70 Mhz	640 x 480 frames at 28 fps

The CAST MPEG-4 is ready for integration in an SoC or board. It works with any microprocessor, which need only supervise the encoding process and perform ancillary tasks such as bit rate control. The core also requires external memory for a frame buffer; a single 16 or 64 Mbit SDRAM with a 16-bit wide data bus is sufficient.

The MPEG-4 core was developed by CAST partner Ocean Logic, based in Australia (see www.ocean-logic.com).

