



System-On-Chip Technologies

PRODUCT BRIEF

Video Encoder IP Cores

The MPEG-2, H.264, and H.265 Video Encoder IP Cores offer an advanced solution for real-time video and audio encoding.

Capable of handling resolutions up to 8K at an impressive 120fps, these cores offer ultra-low latency—virtually eliminating any delay between input and output. Designed with remarkable efficiency, it minimizes FPGA resource usage, resulting in a compact footprint and low power consumption.

SOC's IP Cores provide superior efficiency, making them ideal for power-sensitive devices and demanding processing environments.

www.soctechnologies.ca
[+1 519-880-8609](tel:+15198808609)
soc@soctechnologies.ca

MPEG-2 HD/4K Video Encoder IP Core

Harness the Power of MPEG-2 with SOC's Advanced HD/4K IP Cores

The MPEG-2 Video Encoder IP Core delivers high-performance encoding for single or multiple MPEG-2 video streams. Engineered using a proprietary single-clock driven, all-hardware parallel architecture, it ensures superior efficiency without relying on a microprocessor.

SOC offers the MPEG-2 encoder in two versatile formats: IP cores for FPGAs and standalone all-in-one modules. Available for both Xilinx and Intel (Altera) FPGAs, SOC configures the cores to meet your specific requirements, including custom I/O formats.

For easy integration, SOC's System-on-Module (SoM) cards—compact circuit boards built on SOC codec IP cores—can connect seamlessly to your devices or PCBs using a standard DDR3 memory connector.

Whether you choose IP cores or modules, SOC provides tailored solutions to suit your application needs.

Additionally, SOC offers comprehensive product development kits, empowering you to design and develop products utilizing our MPEG-2 video/audio encoder IP cores or modules.

MPEG-2 HD/4K Video Encoder IP Core Key Features

- — □ ALL-HARDWARE DESIGN (No embedded software)
- — □ HIGH SPEED (Low latency)
- — □ SMALL SILICON FOOTPRINT
- — □ LOW POWER
- — □ HIGH RELIABILITY (Due to hardware architecture)
- — □ HIGH VIDEO QUALITY
- — □ LOW OUTPUT BANDWIDTH
- — □ HIGH OUTPUT BANDWIDTH VERSION AVAILABLE
- — □ USER CONTROLLABLE API
- — □ OPTION OF IP CORE OR MODULE
- — □ VIDEO TRANSMISSION (NETWORK) CORES AVAILABLE
- — □ DEVELOPMENT BOARDS AVAILABLE

MPEG-2 HD/4K

Video Encoder IP Core Specifications

Specification	MPEG-2 HD	MPEG-2 4K
Standard:	MPEG-2/H.262 (ISO/IEC 13818)	MPEG-2/H.262 (ISO/IEC 13818)
Profiles:	High, Main, Baseline	High, Main, Baseline
Output bit rates:	1-100Mbps	1-100Mbps
Video resolutions:	Up to 1080i/p	Up to 2160p
Frame rate:	Up to 60fps	Up to 60fps
Chroma formats:	4:2:2 or 4:2:0	4:2:2 or 4:2:0
Output format:	MPEG-2 Elementary, or Transport Stream	MPEG-2 Elementary, or Transport Stream
Video input format:	RGB or YUV	RGB or YUV
Audio support:	MPEG-2 Layer-II or AAC	MPEG-2 Layer-II or AAC
Latency:	1/16 frame	1 frame
FPGAs:	Xilinx or Intel (Altera)	Xilinx or Intel (Altera)

H.264 HD/4K/8K Video Encoder IP Core

Precision Control and Flexibility: Optimize your Design with SOC's Scalable H.264 HD/4K/8K Encoding Solutions

SOC offers high-performance H.264/AVC encoder IP cores compatible with both Xilinx and Intel (Altera) FPGAs, covering a range of resolutions from HD, 4K and 8K.

Our advanced encoder features a dynamic API, allowing real-time adjustments of key parameters like bit rate, precision, latency, quantization, and GOP to fit your specific application needs.

Optimize your video processing with our versatile video scaler IP core, which adjusts resolution and frame rate before encoding, all controllable via the API.

Enhance your video encoding capabilities with an optional network stack, enabling direct IP network connectivity through a convenient Ethernet port. Effortlessly integrate and transmit high-quality video streams with streamlined network access for a more efficient and versatile encoding solution.

Achieve superior video performance with SOC's innovative encoder solutions, designed for flexibility and top-tier quality in your projects.

MPEG-2 HD/4K Video Encoder IP Core Key Features

- — □ ALL-HARDWARE DESIGN (No embedded software)
- — □ HIGH SPEED (Low latency)
- — □ SMALL SILICON FOOTPRINT
- — □ LOW POWER
- — □ HIGH RELIABILITY (Due to hardware architecture)
- — □ HIGH VIDEO QUALITY
- — □ LOW OUTPUT BANDWIDTH
- — □ HIGH OUTPUT BANDWIDTH VERSION AVAILABLE
- — □ USER CONTROLLABLE API
- — □ OPTION OF IP CORE OR MODULE
- — □ VIDEO TRANSMISSION (NETWORK) CORES AVAILABLE
- — □ DEVELOPMENT BOARDS AVAILABLE

H.264 HD/4K/8K

Video Encoder IP Core Specifications

Specification	H.264 HD	H.264 4K	H.264 8K
Standard:	H.264/AVC (ISO/IEC14496-10)	H.264/AVC (ISO/IEC14496-10)	H.264/AVC (ISO/IEC14496-10)
Profiles:	High, Main, Baseline	High Profile	High Profile
Output bit rates:	1-100Mbps	4-600Mbps	8-600Mbps
Video resolutions:	Up to 1080p/ Up to 120fps	Up to 4K (3840X2160)/ Up to 120fps	Up to 8K (7680x4320)/ Up to 60fps
Precision	8/10 bits	8/10 bits	8/10 bits
Chroma formats:	4:2:2 or 4:2:0	4:2:2 or 4:2:0	4:2:2 or 4:2:0
Output format:	H.264 Elementary, or Transport Stream	H.264 Elementary, or Transport Stream	H.264 Elementary, or Transport Stream
Video input format:	RGB or YUV	RGB or YUV	RGB or YUV
Audio support:	MPEG-2 Layer-II or AAC	MPEG-2 Layer-II or AAC	MPEG-2 Layer-II or AAC
Latency:	1/16 frame	1 frame	1 frame
FPGAs:	Xilinx or Intel (Altera)	Xilinx or Intel (Altera)	Xilinx or Intel (Altera)

H.265 HD/4K Video Encoder IP Core

Drive Innovation with SOC's H.265/HEVC IP Cores: High Efficiency, High Resolution, High Impact

SOC delivers performance H.265 HD/4K encoding in two dynamic formats to meet your needs: FPGA IP cores and all-in-one hardware modules.

- **FPGA IP Cores:** Available for both Xilinx and Altera FPGAs, these high-performance cores are customizable to your specific requirements, including I/O formats.
- **All-in-One Hardware Modules:** The SOC codec modules are System-on-Module (SoM) cards that connect seamlessly to your devices or PCBs using a standard DDR3 SODIMM connector.

Whether you're choosing IP cores or modules, SOC provides flexible solutions with the option of Xilinx or Altera FPGAs. Enhance your development process with our product development boards and explore our comprehensive offerings designed to elevate your video encoding performance.

MPEG-2 HD/4K Video Encoder IP Core Key Features

- — □ ALL-HARDWARE DESIGN (No embedded software)
- — □ HIGH SPEED (Low latency)
- — □ SMALL SILICON FOOTPRINT
- — □ LOW POWER
- — □ HIGH RELIABILITY (Due to hardware architecture)
- — □ HIGH VIDEO QUALITY
- — □ LOW OUTPUT BANDWIDTH
- — □ HIGH OUTPUT BANDWIDTH VERSION AVAILABLE
- — □ USER CONTROLLABLE API
- — □ OPTION OF IP CORE OR MODULE
- — □ VIDEO TRANSMISSION (NETWORK) CORES AVAILABLE
- — □ DEVELOPMENT BOARDS AVAILABLE

H.265 HD/4K

Video Encoder IP Core Specifications

Specification	H.265 HD	H.265 4K
Standard:	H.265/HEVC (ISO/IEC 23008-2:2015)	H.265/HEVC (ISO/IEC 23008-2:2015)
Profiles:	Main 8, 10	Main 8, 10
Output bit rates:	1-100Mbps	2-100Mbps
Video resolutions:	HD 1080p/ Up to 60fps	4K at 30fps 4K at 60fps
Precision:	8 /10 bits	8/10 bits
Chroma formats:	4:2:2 or 4:2:0	4:2:2 or 4:2:0
Output format:	H.265 Elementary, or Transport Stream	H.265 Elementary, or Transport Stream
Video input format:	RGB or YUV	RGB or YUV
Audio support:	MPEG-2 Layer-II or AAC	MPEG-2 Layer-II or AAC
Latency:	1/16 frame	1 frame
FPGAs:	Xilinx or Intel	Xilinx or Intel

SOC Encoder IP Core Design

