

APPLICATION BRIEF AMD EMBEDDED SOLUTIONS FOR DIGITAL CINEMA

Adaptable compute from on-set capture
to DCI-compliant playback



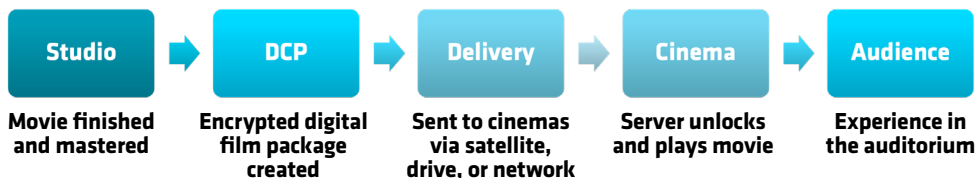
OVERVIEW

Digital Cinema spans the full chain that turns light into a theatrical image: cinema-grade cameras capture high-bit-depth RAW footage on set; mastering and DI systems color-grade, conform, and finish the image in HDR and wide color gamut; DCP creation packages the result against DCI specifications; and cinema servers, integrated media blocks (IMBs), and RGB-laser projectors deliver it to the auditorium in sync with immersive audio. Each stage has its own throughput, latency, security, and certification demands, but they share a common need for deterministic, high-bandwidth video processing at 4K, 8K, and HFR.

Premium formats, HDR mastering, high-frame-rate exhibition, and emerging IP-based on-set and post workflows (ST 2110, IPMX) are pushing more pixels, tighter timing, and stronger content security through every box in the chain. At the same time, OEMs face shorter design windows, longer in-field lifecycles, and pressure to support evolving DCI, SMPTE, and content-protection mandates without redesigning silicon every cycle. Meeting that profile takes a compute platform that is fast, deterministic, programmable, and supported for the long haul.

END-TO-END SILICON FOR DIGITAL CINEMA

AMD is the only vendor whose roadmap spans adaptive SoCs, FPGAs, x86 processors, and discrete GPUs. A camera OEM can build sensor-side imaging on an AMD Versal™ or AMD Zynq™ adaptive SoC; a mastering OEM can pair AMD Ryzen™ Threadripper™ PRO or AMD EPYC™ workstations with AMD Radeon™ PRO GPU acceleration for color and finishing; a cinema-server or IMB vendor can combine Ryzen Embedded or EPYC Embedded with an AMD UltraScale+™ FPGA for secure decode, JPEG 2000 or JPEG XS handling, and SMPTE-compliant playout; and projector OEMs can lean on the same FPGA fabric for image processing, geometry correction, and laser-engine control. One supplier with mature toolchains (AMD Vivado™ Design Suite, AMD Vitis™ unified software platform, AMD ROCm™ software), shared driver and BIOS stacks, and a 10+ year embedded supply commitment that aligns with cinema product field life.



KEY BENEFITS

PROGRAMMABLE, OPEN I/O

Re-target SDI, HDMI™, DisplayPort™, ST 2110, IPMX, JPEG XS, and JPEG 2000 in firmware on one device.

DETERMINISTIC VIDEO PIPELINE

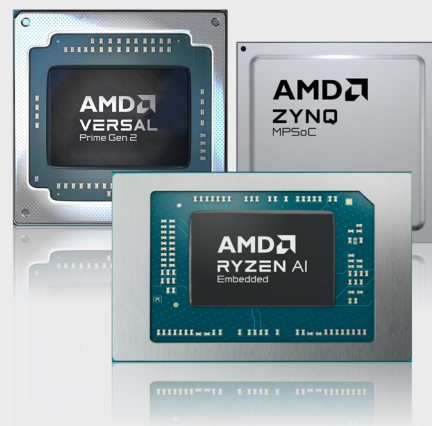
Hardware-accelerated 4K, 8K, and HFR processing with sub-frame, deterministic latency.

ONE PORTFOLIO, ONE ROADMAP

Use AMD technology across cameras, mastering systems, cinema servers, and projectors.

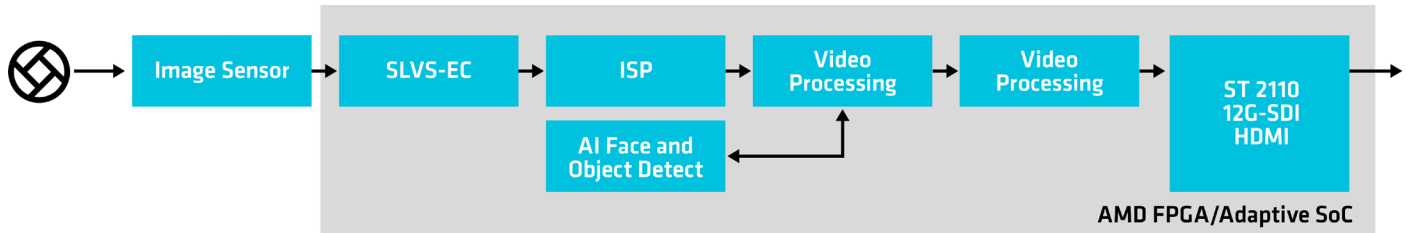
SECURE, LONG-LIFE SILICON

Hardware root-of-trust and crypto acceleration with a 10+ year embedded supply commitment.



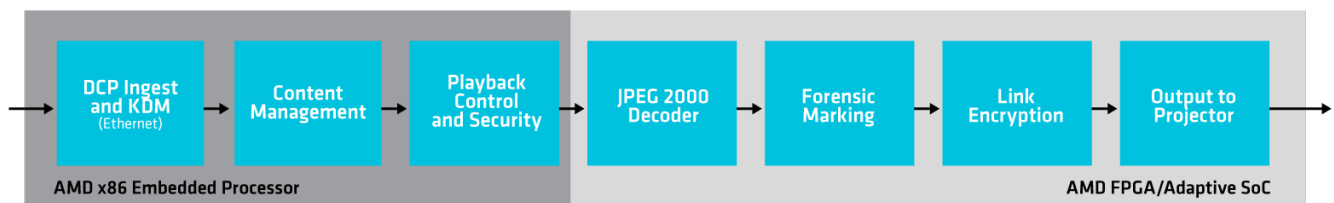
DIGITAL CINEMA CAMERA

A digital cinema camera built on an AMD adaptive SoC runs the entire imaging pipeline on a single chip, from large-format sensor readout and real-time debayer through ISP color science, 3D LUT application, and high-bitrate RAW, ProRes, JPEG 2000 or JPEG XS encoding. The programmable logic layer lets the same hardware output ST 2110, 12G-SDI, or HDMI streams, selectable by firmware rather than board redesign, so OEMs can certify one camera platform for IP-based virtual production stages and traditional SDI workflows alike. This hardware adaptability also allows field updates, extending product life and revenue streams.



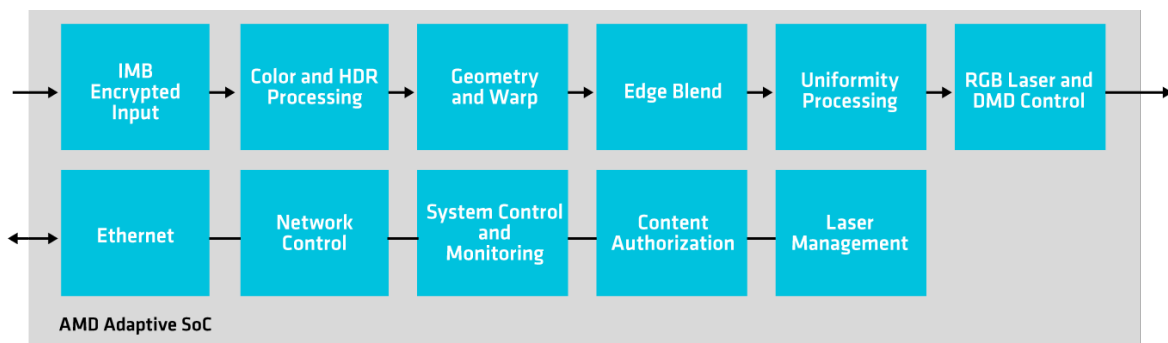
DIGITAL CINEMA SERVER / IMB

A DCI-compliant cinema server with an Integrated Media Block (IMB) is built on AMD Ryzen Embedded or AMD EPYC Embedded for content management, playback control, and security, paired with an AMD FPGA/SoC for hardware-accelerated JPEG 2000 decode, link encryption, and forensic marking. The x86 Embedded processor manages DCP ingest, KDM handling, and show scheduling; the FPGA fabric handles the deterministic real-time path by decoding 4K/HFR JPEG 2000 streams, applying forensic watermarks, and driving DCI-compliant encrypted output to the projector head. The AMD portfolio covers both the secure compute domain and the real-time media path, simplifying certification and shortening the validation cycle.



DIGITAL CINEMA PROJECTOR

A DCI-class projector built on AMD adaptive SoCs runs the full image-processing chain on programmable silicon: real-time decompression, color space conversion, HDR processing, geometry correction, edge blending, and per-pixel uniformity correction at 4K and beyond. The FPGA fabric also drives RGB laser engine control, sync, and safety interlocks deterministically, while an embedded Arm® processor subsystem handles lamp/laser management, content authentication, and network control. A single adaptive SoC replaces multiple fixed-function chips, reducing BOM cost and board area, and the validation effort needed to qualify each new projector model against evolving DCI and SMPTE specifications.



AMD SILICON BENEFITS FOR DIGITAL CINEMA

REQUIREMENT	AMD CAPABILITY	OEM BENEFIT
SECURE IMB SOC	• AMD Zynq UltraScale+ and Versal adaptive SoCs combine Arm application cores with programmable logic and integrated crypto engines.	• Single-chip IMB. • Reduced board area vs. multi-chip ASSPs. • Accelerated DCI certification.
LONG PRODUCT LIFECYCLE	• Up to 15-year longevity commitments on adaptive SoC families. • Up to 10 years on x86 Embedded processors.	• Protects OEM's projector and server platform investment. • Reprogrammability and longevity means no mid-life re-spins.
DCI / FIPS SECURITY COMPLIANCE	• AMD Zynq UltraScale+ and Versal adaptive SoC security subsystems provide hardware root of trust, secure boot, tamper detection, on-die key storage, AES/SHA accelerators.	• Fast path to DCI compliance.
ALT-CONTENT & LIVE EVENT PLAYOUT	• Integrated HEVC/AVC video codec units, IP partner cores for 4K and 8K JPEG 2000 and JPEG-XS, and high-speed transceivers for IP media such as ST 2110 and IPMX.	• Same platform serves DCI cinema and pro-AV event use cases.

NEXT STEPS

For more information on Broadcast AV solutions, visit www.amd.com/broadcastav

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