

# Marvell ARMADA 1500 PRO 4K

Ultra High-definition Media Processor System-on-chip with Quad-core CPU

**ARMADA**  
smart tv

## PRODUCT OVERVIEW

The Marvell® ARMADA® 1500 PRO 4K (88DE3214) ultra high-definition secure media processor is a system-on-chip (SoC) delivering multi-core CPU/GPU performance, industry leading Ultra HD video, and robust security to PayTV set-top box (STB), and over-the-top (OTT) box markets. The ARM-based ARMADA 1500 PRO 4K features an enhanced Qdeo® Video Processor capable of 2160p60 10bit HEVC decoding to address the Ultra HD content services that PayTV operators around the world are launching for a highly immersive TV entertainment experience. In addition, Marvell's latest SoC integrates 12K DMIPs Quad Core ARM Cortex A9 CPU for supporting the wide range of Smart TV services being rolled out in the living room to give consumers the ultimate multi-screen experience around the highest quality video. The ARMADA 1500 PRO 4K includes a powerful multi-core 3D GPU (Vivante GC3000) further underscoring Marvell's value proposition of enabling operators to deliver a compelling UI and revenue generating applications such as gaming in cost effective, small form factor, elegant consumer devices. This innovative architecture brings impressive processing power to the digital entertainment market, unifying the user experience between the small screens in our homes (mobile, tablet) and the large ones (TV, cable boxes). The video/audio codec subsystem supports decode of up to 2160p60 H.265, H.264, VC-1, MPEG2, AVS, VP8 and several other formats, and allows for decode/encode of HE-AACv2, Dolby HD®, DTS-HD®, SRS® and other high-end audio formats. ARMADA 1500 PRO 4K's overall security architecture including secure boot, Trusted Rendering Path, and full TrustZone® enables operators to bring together the best OTT + PayTV experience with high level of content protection. Also included is Marvell's award-winning Qdeo video post-processing pipeline that provides picture quality (PQ) enhancements that meet the standards of top TV makers worldwide. This device integrates both HDMI v2.0 output as well as multiple transport stream inputs, dual-channel LVDS output and CVBS analog video output with I2S and S/PDIF input/output to minimize the video/audio components required in the system and save on bill-of-materials (BOM). Peripheral connectivity includes Gigabit Ethernet (RGMII), Fast Ethernet with integrated PHY, 1 x SATA 3.0 host port, 2 x USB 2.0 host ports, 2 x SDIO 3.0 controllers, and PCIe. Coupled with NAND Flash and DRAM, the ARMADA 1500 PRO 4K is the ideal SoC platform solution solution for the next generation of STBs that service operators (Telco, Cable, Satellite) are deploying enabling new Ultra HD & Smart TV services.

## BLOCK DIAGRAM

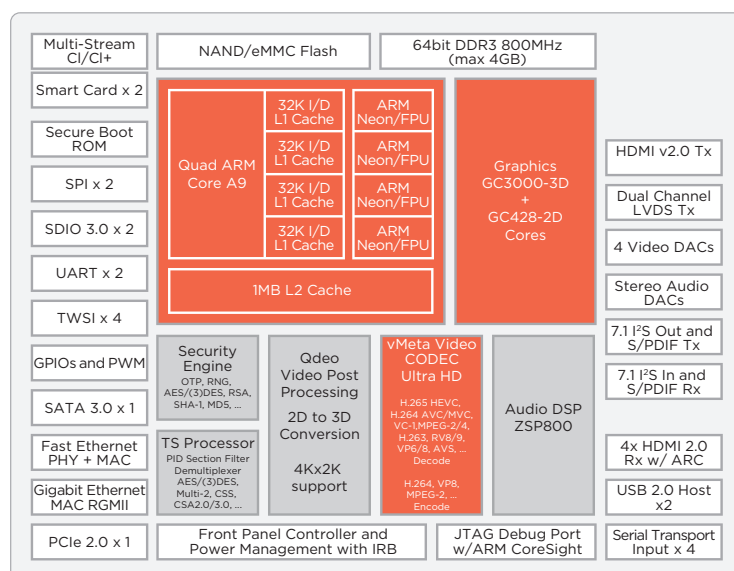


Fig 1. Marvell ARMADA 1500 PRO 4K Block Diagram

## FEATURES AND BENEFITS

SPECIAL FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>Up to 12000 DMIPs Quad Core ARM CA9 CPU with 1MB L2 Cache</li> </ul>	<ul style="list-style-type: none"> <li>Enabling rich media/web based TV applications and Android TV services in single SoC</li> </ul>
<ul style="list-style-type: none"> <li>3840x2160 (UHD) at 60 frames per second 10-bit HEVC Decode</li> </ul>	<ul style="list-style-type: none"> <li>Decodes highest resolution video, a critical feature that consumers will demand with the mass installation of 4K TVs over the next several years</li> <li>Encode/Decode for multi-screen and video calling applications</li> <li>Includes noise reduction, format conversion and enhancement</li> </ul>
<ul style="list-style-type: none"> <li>Multi-core GPU, 8 shader Vivante GC3000</li> </ul>	<ul style="list-style-type: none"> <li>OpenGL ES 1.1/2.0/3.0, OpenCL 1.2, and DirectFB for gaming applications and enabling ultimate UI</li> </ul>
<ul style="list-style-type: none"> <li>Dedicated Robust Security Engine including secure boot, Trusted Rendering Path, and full TrustZone®.</li> </ul>	<ul style="list-style-type: none"> <li>Offers premium content support with multiple DRM/CAS options: Verimatrix®, Widevine®, Playready®, NDS® VGC, DTCP-IP</li> <li>Trusted Path certified by Service Operators and Content Owners Worldwide</li> </ul>
<ul style="list-style-type: none"> <li>Hybrid Architecture</li> </ul>	<ul style="list-style-type: none"> <li>Quad TS inputs supports PayTV Operator STB requiring both broadcast (DVB-T,C,S) and IP content for deployment of a compelling unified OTT and PayTV entertainment experience</li> </ul>
<ul style="list-style-type: none"> <li>Full suite of peripherals</li> </ul>	<ul style="list-style-type: none"> <li>SATA, SDIO, USB for operator/consumer apps such as DVR</li> <li>10/100/1000 Ethernet MAC with RGMII interface for robust IP connectivity</li> <li>PCIe for additional connectivity options for Wi-Fi, cable modem</li> <li>Smartcard interfaces</li> </ul>
<ul style="list-style-type: none"> <li>Android TV reference designs for both TV and set-top box</li> </ul>	<ul style="list-style-type: none"> <li>Full Integration and complete SDK for Fast time to deployment of Unified PayTV and Android based OTT services</li> <li>Complete platforms with multiple connectivity options including Marvell Wi-Fi (2x2 11ac) and Powerline (G.hn) technologies</li> <li>Small, cost effective form factors</li> </ul>

## APPLICATIONS

The ARMADA 1500 PRO 4K delivers the ideal SoC solution for Ultra HD set top boxes with Smart TV services. Marvell is delivering a strong portfolio of SDKs in the ARMADA 1500 Pro 4K platform including both Android and RDK. Service Operators are depending on new open standards SW platforms with proven ecosystems to enable this content and application convergence across all the screens. To shorten system manufacturers’ design cycles and accelerate time to market, Marvell provides complete ARMADA 1500 PRO 4K development platforms and reference designs with device drivers, schematics, layout files and other documentation.

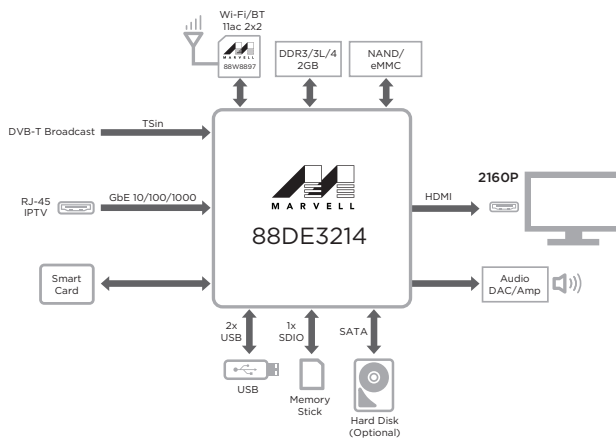


Fig 2. Set-top Box System Block Diagram

**THE MARVELL ADVANTAGE:** Marvell chipsets come with complete reference designs which include board layout designs, software, manufacturing diagnostic tools, documentation, and other items to assist customers with product evaluation and production. Marvell’s worldwide field application engineers collaborate closely with end customers to develop and deliver new leading-edge products for quick time-to-market. Marvell utilizes world-leading semiconductor foundry and packaging services to reliably deliver high-volume and low-cost total solutions.

**ABOUT MARVELL:** Marvell (NASDAQ: MRVL) is a global leader in providing complete silicon solutions enabling the digital connected lifestyle. From mobile communications to storage, cloud infrastructure, Internet of Things (IoT), digital entertainment and in-home content delivery, Marvell’s diverse product portfolio aligns complete platform designs with industry-leading performance, security, reliability and efficiency. At the core of the world’s most powerful consumer, network and enterprise systems, Marvell empowers partners and their customers to always stand at the forefront of innovation, performance and mass appeal. By providing people around the world with mobility and ease of access to services adding value to their social, private and work lives, Marvell is committed to enhancing the human experience. As used herein, the term “Marvell” refers to Marvell Technology Group Ltd. and its subsidiaries.

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