

# Marvell ARMADA 1500 PRO

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

**ARMADA**<sup>®</sup>  
smart tv

## PRODUCT OVERVIEW

The Marvell<sup>®</sup> ARMADA<sup>®</sup> 1500 PRO (88DE3114) high-definition secure media processor is a system-on-chip (SoC) delivering multi-core CPU/GPU performance, industry leading HD Video, and Robust Security to the Smart TV, set-top box (STB), over-the-top (OTT) box, thin-client device and other digital entertainment device markets. The powerful ARMADA 1500 PRO with a sophisticated security engine, up to 12K DMIPs applications processor and a 38GFLOP graphics processor creates new business models for Smart TV and set-top box implementations, driving the convergence of digital entertainment and gaming applications and paving the way for the next-generation of Smart Home devices. At the heart of this device are three powerful processing subsystems for Applications (Quad-core ARM<sup>®</sup> Cortex A9 CPU), Video (Marvell Vmeta<sup>™</sup> Video codec), and Graphics (Vivante<sup>®</sup> GC4000 GPU). Combined, 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 dual-decode (or one encode, one decode) of 1080p H.264, VC-1, MPEG2, AVS, VP8 and several other formats, and allows for decode/encode of HE-AACv2, Dolby HD<sup>®</sup>, DTS-HD<sup>®</sup>, SRS<sup>®</sup> and other high-end audio formats. ARMADA 1500 PRO's overall security architecture including secure boot, Trusted Rendering Path, and full Trustzone<sup>®</sup> enables operators to bring together the best OTT + PayTV experience with high level of content protection. Also included is Marvell's award-winning Qdeo<sup>™</sup> video post-processing pipeline that provides picture quality (PQ) enhancements that meet the standards of top TV makers worldwide. This device integrates both HDMI v1.4a output as well as multiple transport stream inputs, dual-channel LVDS output and CVBS/component 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, 3 x USB 2.0 host ports, 2 x SDIO 3.0 controllers, and PCIe. Coupled with NAND Flash and DRAM, the ARMADA 1500 PRO is the ideal SoC for the digital entertainment markets of today and tomorrow.

## BLOCK DIAGRAM

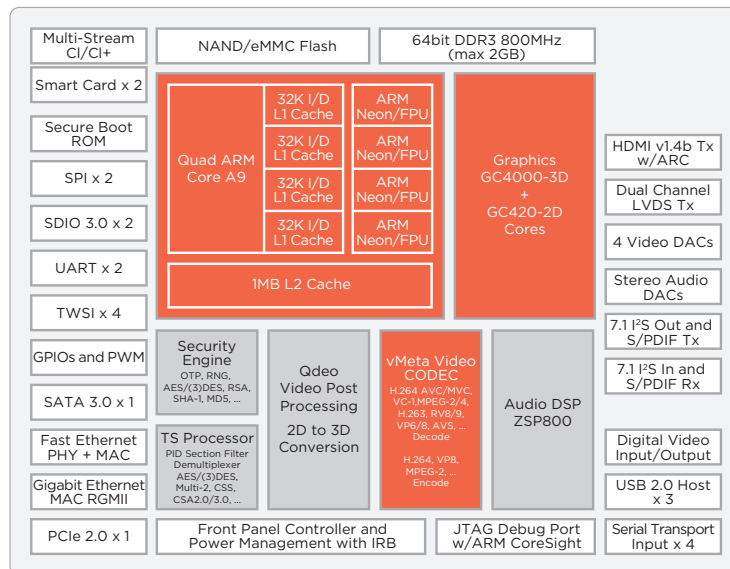


Fig 1. Marvell ARMADA 1500 PRO Block Diagram

## 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> <li>Award-winning Qdeo<sup>™</sup> Video Processing</li> </ul>	<ul style="list-style-type: none"> <li>Enabling rich media/web based TV applications and Android TV services in single SoC</li> <li>Delivers consistently high-quality 1080p60 video despite the source, for an immersive viewing experience</li> <li>Encode/Decode for multi-screen and video calling applications</li> <li>Includes noise reduction, format conversion and enhancement</li> </ul>

**FEATURES AND BENEFITS** *continued*

SPECIAL FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>Multi-core GPU, 8 shader Vivante GC4000 – 38GFLOPs performance</li> </ul>	<ul style="list-style-type: none"> <li>OpenGL ES 1.1/2.0 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 WiFi, 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 delivers the ideal SoC solution for a broad range of applications in the digital entertainment space. It enables devices including Smart TVs, PayTV STBs (DVR, thin client), OTT boxes and Net monitors (all-in-one devices). The ARMADA 1500 PRO offers Android TV and Linux software development kits (SDK). To shorten system manufacturers' design cycles and accelerate time to market, Marvell provides complete ARMADA 1500 PRO development platforms and reference designs with device drivers, schematics, layout files and other documentation.

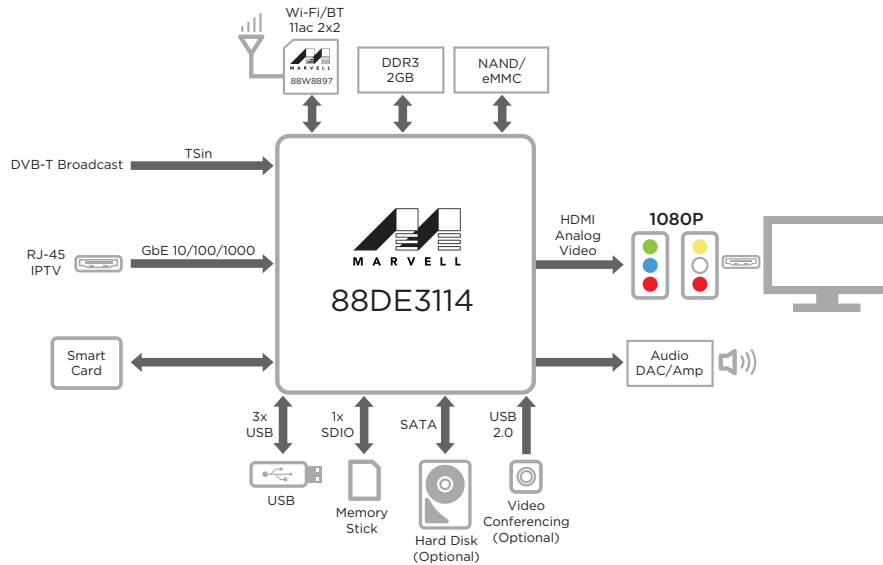


Fig 1. Set Top Box System Block Diagram

**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, 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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