

Ubicom IP8100 Network Processor Family

Multithreaded Processors Optimized for Networking

IP8100 Processor Overview

The Ubicom IP8100 processor family enables a broad range of high-performance, low-cost networking applications for consumer, service-provider, and small-business network-infrastructure devices. Using an advanced, multi-threaded architecture optimized for networking, the IP8100 processor family provides 2 Gbps of true system throughput in a Linux OpenWrt router. An advanced interface architecture combines high-performance networking and peripheral interfaces such as USB3.0 (SuperSpeed) and PCI Express Gen-2 with a set of highly flexible software configurable interfaces, allowing the IP8100 network processor to seamlessly interface with a wide array of devices, including wired and wireless networking chipsets, mass storage devices, and many others.



The combination of high-performance networking, flexible interface capabilities, and on-chip hardware engines makes the Ubicom IP8100 family of network processors an ideal platform on which to build next-generation networking products that merge traditional networking requirements with emerging content-distribution and management capabilities.

Key Features

High Performance Networking

Ubicom's advanced CPU architecture enables 2 Gbps of TCP NAT routing performance on a fully featured Linux OpenWrt router. Capable of flexibly supporting a variety of networking protocols, the IP8100 is optimal for consumer and SMB routers, access points, and security routers (UTM and VPN), as well as in-home service provider equipment, including triple-play gateways, femtocells, and content distribution devices including MoCA and HomePlug equipment.

Flexible Interfaces

The IP8100 processor family offers a combination of very high-performance networking and peripheral interfaces such as USB3.0 (SuperSpeed), USB2.0 (Hi-Speed, OTG), PCI Express Gen-2 (PCIe), and Gigabit Ethernet with an extremely flexible set of programmable interfaces. These enable the IP8100 to control and to seamlessly interface to display panels, audio chips, storage devices, and any other standard interface device without the need for intervening glue logic. Through its highly flexible software-configurable interface architecture, the IP8100 is able to provide total connectivity to all system devices with reduced design complexity and at a low cost point.

Security Engine

A dedicated hardware security block enables the Ubicom IP8100 network processor to attain up to 150 Mbps of IPsec VPN throughput. The security engine natively supports AES up to 256b, SHA-1, SHA-2 up to 512b, DES, 3DES, and MD5. Additionally, the engine is programmable to support a wide variety of additional security protocols, as well as DRM protocols for media applications.

StreamEngine™ QoS

StreamEngine is Ubicom's patented QoS engine, capable of providing fine-grain quality of service monitoring and control at maximum system throughput and enabling the best user experience for streaming media. IP8100 processors can utilize StreamEngine to classify traffic through the processor in order to prioritize low-latency, real-time content such as VoIP traffic, streaming video, and gaming traffic ahead of background file transfer and web browsing traffic. This yields a superior user experience for devices behind the StreamEngine-equipped router or networking device. StreamEngine can be autonomously operated (where the traffic is prioritized automatically) or configured by users to separate specific types of traffic.

Category	Sample Applications
Consumer Routers	Media routers Dual concurrent 802.11n 3x3 routers Routers with USB3.0 storage
Service Provider Home Gateways	High performance services gateways 4G WiMAX/LTE routers Femtocells
SMB APs/Routers	SMB VPN/UTM routers SMB/Enterprise APs



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Features

Ubicom32™ 32-bit Processor Core

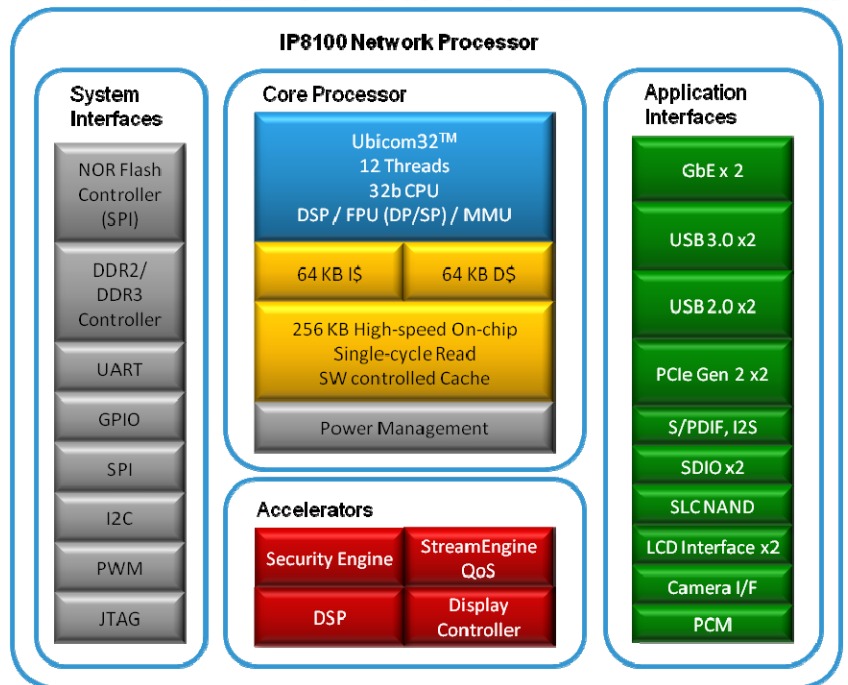
- ▶ Up to 800 MHz
- ▶ 12 multithreaded tCPUs (hardware threads)
- ▶ 64KB instruction cache, 64KB data cache
- ▶ 256KB on-chip memory for high performance accesses
- ▶ 16-bit/32-bit DDR2 or DDR3 DRAM at up to 1066 MTs (533 MHz)
 - Optional 4-bit ECC
 - Up to 1 GByte memory capacity
- ▶ 1.0V core voltage

High Performance, Flexible I/O

- ▶ 2 x PCI Express (PCIe) Gen. 2
- ▶ 2 x USB 3.0 (SuperSpeed) with PHY
- ▶ 2 x USB 2.0 (Hi-Speed) with PHY
 - 1 x USB 2.0 OTG
 - 16 x Host channels or 8 x Device EPs per USB2.0
- ▶ 2 x RGMII / TMII / MII with Gigabit Ethernet MACs
- ▶ 2 x SDIO
- ▶ 2 x LCD Display Controllers
- ▶ Serial and TDM interfaces (SPI, UART, GPSI, I2C)
- ▶ I2S up to 192 kHz, 24-bit
- ▶ Flash controller
- ▶ PWM
- ▶ GPIO

Security Engine

- ▶ Up to 150 Mbps IPsec VPN
- ▶ Supports a wide variety of encryptions
 - AES (up to 256-bit), DES, 3DES
 - MD5, SHA1, SHA2 (up to 512-bit)



Packaging

- ▶ 289 ball PBGA
 - 14 x 14 mm package
 - 0.8 mm ball pitch
- ▶ Available in commercial (0°–70° C) temperature range

Other

- ▶ Application reference designs available

About Ubicom

Ubicom develops networking and media processor solutions that address the unique demands of real-time interactive applications and multimedia content delivery in the digital home. The company provides optimized, system-level solutions to OEMs and ODMs for a wide range of products including streaming and networked media devices, wireless routers, access points, and other networked devices.

