BROADCOM®

Product Brief

BCM58732 SoC

Octal-Core 64-bit ARMv8 Communication Processor

Highlights

- CPU:
  - Octal-core ARMv8 64-bit Cortex-A72 up to 3.0 GHz
  - 2-stage address translation for Virtualization with I/O MMU
  - 48 KB I-cache and 32 KB D-cache per core
  - 8 MB total L2 cache
  - 8 MB of L3 cache
- Interconnect:
  - Coherent interconnect with I/O coherency
  - Per master memory IP address virtualization
- Memory: 2 channels of 72-bit wide DDR4-2400 memory controller with ECC (64b data, 8b ECC)
- Virtual NIC/DMA functions:
  - 16 multi-channel virtualized NICs with dedicated DMA rings
  - COS, Flow-based, TSS, and RSS-based ring assignment
  - TCP/UDP offload (TCO, TSO)
  - 4 Ethernet interfaces with loopback for EVB
- Secure boot engine: Secure key storage, PKA engine, random number generator, timers, and BBRAM
- Standard I/O Connectivity:
  - 1 SDIO/eMMC 4.41
  - NAND SLC/MLC Flash interface
  - 2× UART, 2× SPI, MDIO, GPIO (16)

Overview

The BCM58732 is an octal-core 64-bit 3 GHz ARMv8 Cortex-A72 communication processor targeting a broad range of enterprise networking applications including control plane processing, 50G service routers and gateways, and high-performance processing applications. The BCM58732 combines advanced computing, networking, and virtualization functions on a single SoC with a high-speed 3.0 GHz ARM Cortex-A72 CPU delivering 120,000 DMIPS. This boosts control plane performance and also allows a single processor for both control plane and data plane tasks.

CPU Cores

The BCM58732 integrates eight (8) high-performance ARMv8 Cortex-A72 CPU cores. The StrataGX® family of chips raises clock speed from 2.4 GHz to 3.0 GHz. Each Cortex-A72 core has a four-way set-associative 48 KB of instruction cache and a four-way set-associative 32 KB of data cache and also include a NEON floating point and DSP engine. ARM architecture provides native virtualization support. The CPU cores provide full software compatibility with 32-bit ARMv7 architecture. The eight cores are in four clusters of two cores, each cluster with 2 MB of L2 cache.

Server Class Network Interface

The BCM58732 integrates Broadcom's server class network interface controller with virtualization, stateless offloads, and packet processing capabilities. As a result, the BCM58732 networking interfaces can be shared across various VMs, increasing productivity and bandwidth efficiency. Moreover, Broadcom's TruFlow™ packet flow processing technology enables Open vSwitch acceleration through CPU offload helping to scale and increase VNF density in addition to offering flexible Software-Defined Networking (SDN) provisioning and policy controls.

Memory Sub-System

The memory system supports two channels of high-speed DDR4-2400 memories. The data bus width for each channel is 64 bits with an 8-bit optional ECC.

BroadSAFE® Technology

The BCM58732 supports advanced security features collectively known as BroadSAFE. The part supports secure boot. Other BroadSAFE features include hardware and software support for ARM TrustZone, code and data protection with features such as external memory encryption and dynamic encryption key generation. A FIPS-certified true random number generator is included and PKA is supported as well. The cryptographic engine supports the following algorithms: AES-128, AES-192, AES-256, AES-XTX, AES-CCM, DES, 3DES, ECB, CBC, CTR encryption; SHA-1, SHA-3, SHA-224, SHA-256, MD5 hashing with and without HMAC.

Key Features (con't)

- High-Speed I/O connectivity:
  - 50G, 40G, 25G, and 10G Ethernet interfaces
  - Dedicated RGMII Ethernet management port
  - 16 PCIe Gen3 (configurable as 4×2, 4×1, 2×4, and 2×8)
  - 2× USB 3.0 + 1× USB 2.0
  - 2-port SATA 3.0 (6 Gb/s) AHCI controller with integrated PHY

Target Applications

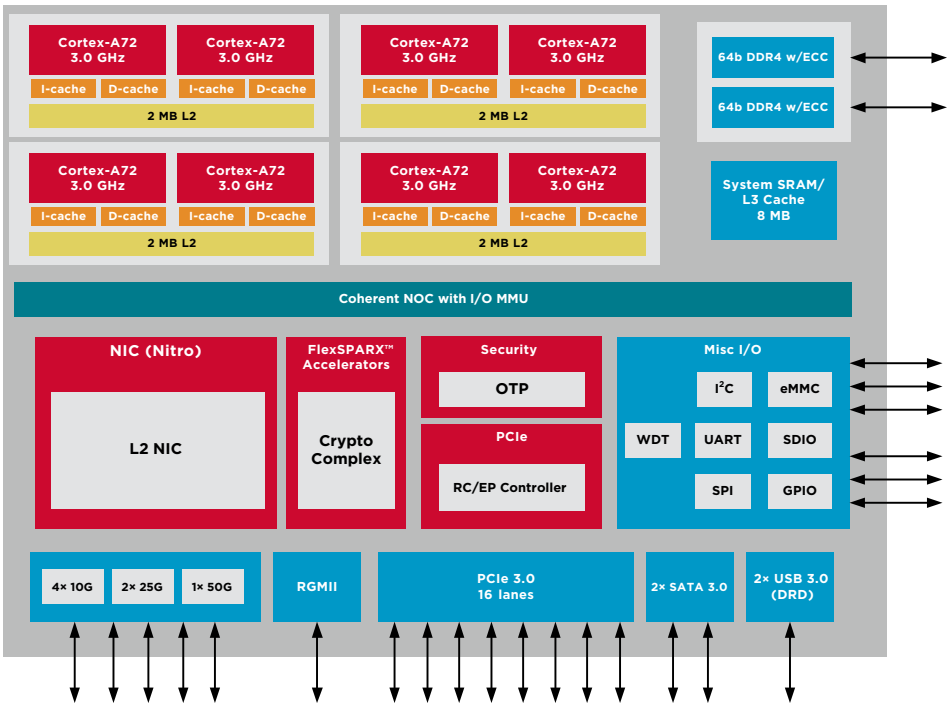
- Enterprise and Carrier Switch Control Plane
- Wireless Access and Mobile Backhaul Equipment
- Enterprise Service Routers
- Security Appliances
- Data Center and TOR Control Plane
- Advanced Fiber Home Gateways

Protocol-specific combined modes such as cross-connected engines for single-pass authentication and encryption, IPSec, TLSv1, SSLv3, and AES-GCM are also supported.

Pre-Integrated Software

The BCM58732 SoC is supported by the Yocto-compliant Linux Development Kit (LDK) and pre-integrated Switch Development Kit (SDK). The BCM58732 software includes support for open source projects and development models (KVM, DPDK, and ODP).

BCM58732 Block Diagram



Product Highlights and Benefits

Highlight	Benefit
ARMv8 64-bit architecture	Address space beyond 4 GB.
FlexSPARX accelerators	Offload packet processing from main CPU cores freeing them for application and service processing.
50GE SerDes integrated in the processor	High-performance interface for throughput demands of next generation Enterprise and Service Provider platforms.
Hardware Virtualization Support	High-performance execution of multiple virtual machines with native support for shared memory and interfaces.
NIC Interface	High-speed connectivity and network offload.
BroadSAFE Secure Architecture	90 Gb/s cryptographic accelerator, secure boot, and so on.
Broadcom Linux Development Kit	Yocto-compliant LDK with pre-integrated switch and wifi drivers. Support for open source projects and development models (KVM, DPDK, and ODP).

Ordering Information

Part Number	Description	Package	Ambient Temperature
BCM58732HB0KFSB30G	8-core 3.0 GHz	33 mm × 33 mm FCBGA	0°C to 70°C
BCM58732HB0KFSB24G	8-core 2.4 GHz	33 mm × 33 mm FCBGA	0°C to 70°C

BROADCOM®
connecting everything®

For more product information: broadcom.com

58732-PB100 05.30.18