



OPTIMIZED COMMUNICATIONS PROCESSOR WITH NETWORK ACCELERATION

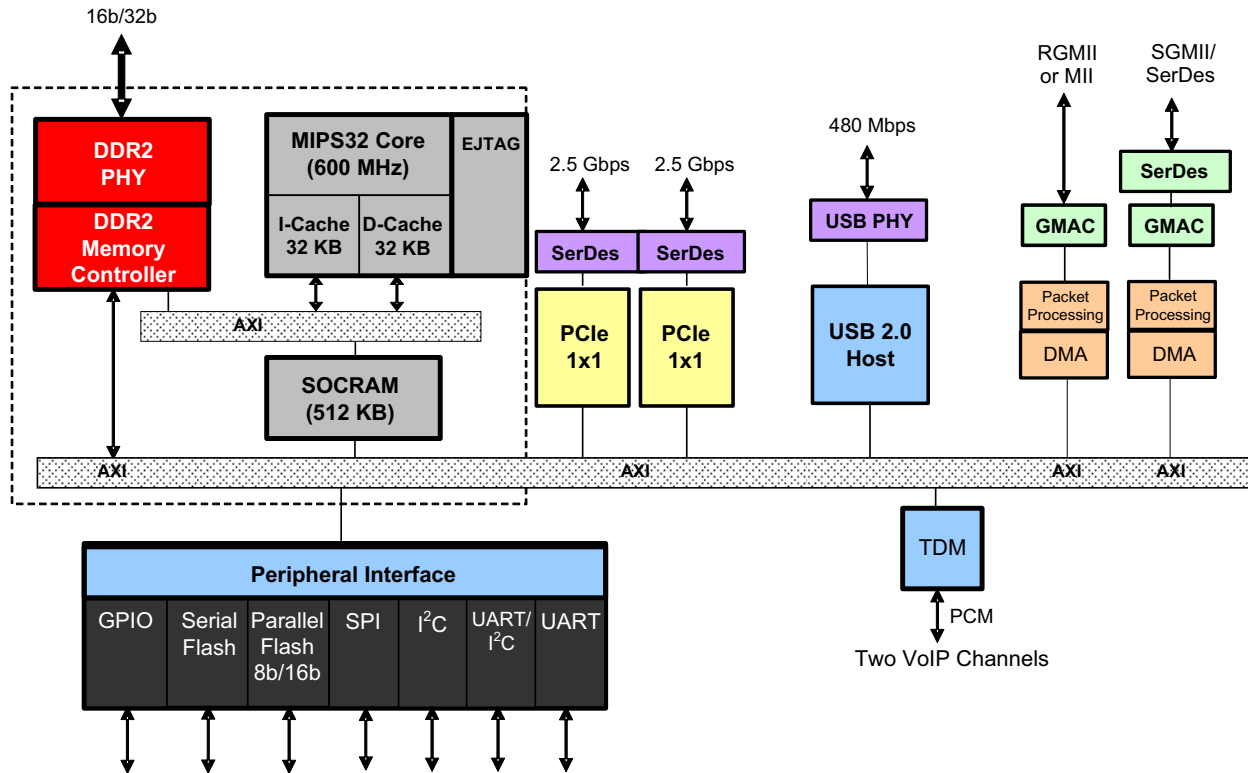
FEATURES

- **Latest MIPS32[®] 74K Core**
 - Dual-issue machine with out-of-order execution
 - 32-KB I-cache, 32-KB D-cache
 - Supports DSP ASE v2.0
 - BCM53001: 400 MHz (800 DMIPS)
 - BCM53003: 600 MHz (1200 DMIPS)
- **On-chip Network Acceleration**
 - Supports L2/L3/L4 packet classification
 - ContentAware[™] processing based on TCAM technology
 - Traffic Quality of Service (QoS) assignment
- **Integrated SoC RAM**
 - 512 KB
- **Dual Gigabit Ethernet Media Access Control (MAC)**
 - 1-GMAC (SGMII)
 - 1-GMAC (MII/RGMII)
- **DDR2 Memory Controller**
 - 200 MHz – 333 MHz (16 or 32 bits)
 - Maximum memory size: 1 GB
 - On-chip PHY
- **Dual PCI Express[®] Interface**
 - Each interface supports x1 lane
 - Compliant with PCI Express base specification v1.1
 - On-chip SerDes
- **Single USB 2.0 Host Port with on-chip PHY**
- **Flash Memory**
 - Support for both Serial Flash (up to 32 MB) and Parallel Flash (up to 256 MB)
 - Both NOR and NAND types
- **TDM Interface**
 - Support for up to two full-duplex VoIP channels
- **Additional Peripheral Interfaces**
 - UART, I²C, SPI, MDIO, JTAG, GPIO
- **65 nm LP process**

SUMMARY OF BENEFITS

- **Industry-leading Price/Performance**
 - Powered by superscalar MIPS74K CPU core running at 600 MHz
 - Latest high-speed interfaces such as PCIe[™], dual GMACs, and DDR2
 - Low-cost benefits of 65 nm LP process technology
- **Optimized Mix of CPU Performance and Peripherals**
 - Allows high CPU utilization due to balance of interconnect, I/O, and memory bandwidth with CPU performance
 - On-chip packet processing allows for significant processing throughput available for other control plane tasks
 - Point-to-point interconnect fabric (AXI) provides high-bandwidth and low-latency for on-chip processing requirements
- **Complete Solutions for Targeted Applications**
 - Switch Control and Management, Metro Ethernet Customer Premises Equipment (CPE), Enterprise Access Point
 - Total hardware solution with Broadcom SMB and Enterprise switches (ROBO and XGS) and PHYs
 - Broadcom FASTPATH[®] and SmartPATH[™] management software provides fast time-to-market for Enterprise and SMB switches, Metro Ethernet CPE, and Enterprise Access Point applications
 - Evaluation/development boards available for target applications
- **Cost-Effective and Power-Efficient**
 - Highly integrated device requiring fewer external components
 - Flash memory with support for both NOR and NAND types
 - DDR2 memory interface to connect to commodity memory
 - Produced in low power 65 nm LP process technology

OVERVIEW



BCM53001/BCM53003 Block Diagram

The BCM53001/BCM53003 is a family of communication processors designed to deliver leading-edge system-level performance while still being very cost-effective and power-efficient. Optimized for price/performance, it is designed for next-generation communication applications in switch control and management, Metro Ethernet CPE, and Enterprise access points. Complete solutions, including processor, switch, PHY, and management software, are available for all target applications. Evaluation boards for each target application provide a fast time-to-market platform for system development.

At the heart of the processor is the powerful MIPS74K core, capable of running at a maximum frequency of 600 MHz. With a superscalar dual-issue pipeline and out-of-order execution, the processor delivers up to 2 DMIPS/MHz. Furthermore, the BCM53001/BCM53003 features

specialized network acceleration hardware, enabling it to offload CPU intensive processing tasks. The point-to-point interconnect fabric (AXI) ensures there are no performance bottlenecks for on-chip processing.

The MIPS74K core is complemented by the latest high-speed interfaces such as dual GMACs, PCIe, USB 2.0, and DDR2 enabling the BCM53001/BCM53003 to deliver leading-edge system performance. The processor also integrates a TDM interface providing support for up to two full-duplex VoIP channels. Manufactured using 65 nm LP process technology, the processor is optimized for low-power consumption.

The processor is available in two versions:

1. BCM53001—400-FBGA package at 400 MHz
2. BCM53003—484-PBGA package at 600 MHz

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