BROADCOM®

Product Brief

BCM53650

Low-Power Gigabit Ethernet Access Switch with Quad-Core CPU and Secure Boot

Overview

The Broadcom® BCM53650 is a Gigabit Ethernet switch packed with advanced features including a powerful multi-core Arm CPU, a hardware Secure Boot engine, and very high levels of I/O integration. The integrated Secure Boot engine with Hardware Root-of-Trust capabilities permits secure, tamper-proof systems. The quad-core Arm processor increases performance by six times over previous embedded CPUs, thereby providing opportunities for developing differentiated applications. The high level of I/O integration, with 25 embedded copper GPHYs, including the management interface and an eMMC interface, enable compact, low-cost systems. The efficient pipeline and advanced design techniques deliver a low-power solution, allowing many fanless system configurations.

The Broadcom 53650 is a System-on-a-Chip (SoC) designed for enterprise access and edge uses. A single device offers the popular 24 x 1GbE switch while two devices are cascaded to build a non-blocking 48 x 1GbE solution, with both configurations offering 4 x 10GbE uplinks and 40G stack bandwidth.

The BCM53650 builds on the successful BCM53547 and BCM56160 device families. The DDR4 interface supports twice the amount of memory and increases the interface speed by 50%. It also supports ECC, thereby protecting the system from unexpected crashes by automatically correcting data errors in memory. It provides advanced capabilities such as native VxLAN support, policy-based network segmentation, multi-tenancy, and larger table scales.

Key Features

- Integrated quad-core Arm processor
- Integrated Secure Boot providing Hardware Root of Trust
- Low power consumption allowing fanless designs
- Embedded multi-media card (eMMC) interface
- Fully integrated PHYs for a single chip 24-port GbE solution
- Integrated Management PHY
- Multiple 10GbE links used flexibly for uplink, stacking, and multigigabit connectivity
- DDR4 interface with ECC support
- Optimized package enabling low-cost 4-layer PCB designs for the Enterprise Edge
- Supports network micro-segmentation
- Supports overlays and multi-tenancy
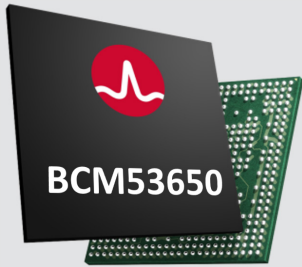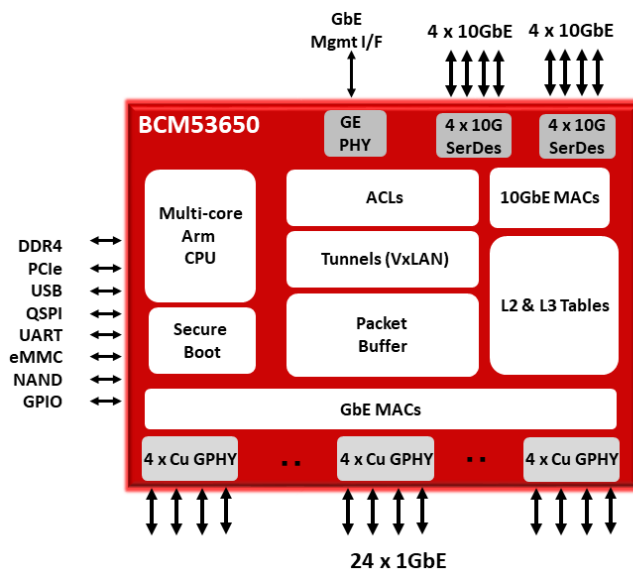- Supports low-power Energy-Efficient Ethernet (EEE)

Figure 1: BCM53650 Block Diagram

Benefits

- Fully integrated, single chip solution for 24-port GbE switches
- Low power consumption enables fanless designs
- Integrated quad-core 64-bit Arm processor subsystem provides high application performance
- Secure Boot solution with hardware Root of Trust provides tamper-proof systems and ensures execution of only trusted code
- eMMC NAND flash interface provides high-capacity, low-cost non-volatile storage
- Optimized pinout in a 29 mm x 29 mm package enables four-layer PCB designs
- Uplink and stacking ports to allow easy expandability and connectivity to rest of the enterprise network
- HiGig2™ support allows connection to other StrataXGS® devices
- Native VxLAN support, enabling easy bridging of network segments across physical locations
- Support for group-based policies enables easy network segmentation and security
- Multi-tenancy support available at enterprise edge
- ECC support on DDR4 interface protects the system from crashes caused by data errors in memory
- EEE support, lowering PHY power in periods of low traffic

Figure 1: BCM53650-Based System Configurations
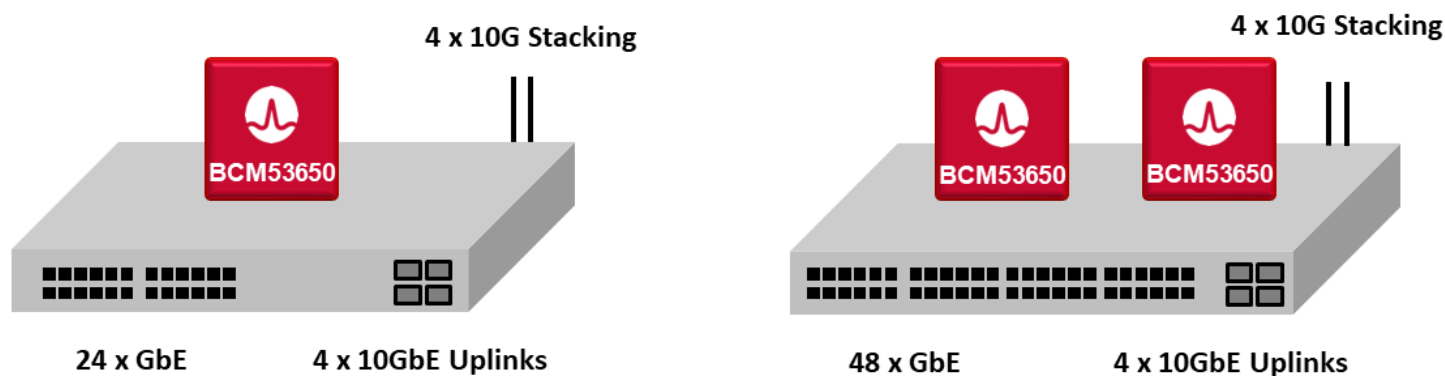
Ordering Information

Part Number	Description	Package Size
BCM53650A0KFSBG	24 x 1G + 4 x 10G with a quad-core CPU and Secure Boot	29 mm x 29 mm
BCM53651A0KFSBG	24 x 1G + 4 x 10G with a single-core CPU and Secure Boot	29 mm x 29 mm
BCM53652A0KFSBG	24 x 1G + 4 x 10G with single-core CPU	29 mm x 29 mm

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