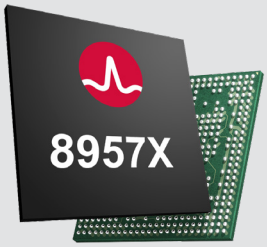
BROADCOM®

Product Brief

BCM8957X

8-Port Integrated BroadR-Reach® Automotive Ethernet Switch



Features

- Fifth-generation automotive Ethernet switch with integrated BroadR-Reach PHYs that supports cost-effective connectivity through lower cabling and connector cost.
- Advanced power savings with multiple low-power mode technologies.
- Highly optimized for multiple in-car network applications.
- Enhanced design to meet stringent automotive production requirements.
- Supports various uplink ports for connectivity to external devices and provides flexible port configurations, making it the perfect solution for in-car applications such as advanced driver-assist camera gateway and infotainment systems.

Applications

- In-vehicle connectivity
- Infotainment system
- Advanced driver assistance systems (ADAS)
- Gate ECUs

Overview

The Broadcom® BCM8957X device is a fifth generation of fully integrated BroadR-Reach® multilayer switch solutions to support automotive qualification (AEC-Q100) and temperature grade for in-car networking applications.

The BCM8957X family of products are the optimal solution for key automotive applications that have high-performance yet challenging low-power requirements. Built upon industry-leading 28-nm architecture, the BCM8957X family of products supports multiple intuitive low-power modes as well as an automotive cable diagnostics feature.

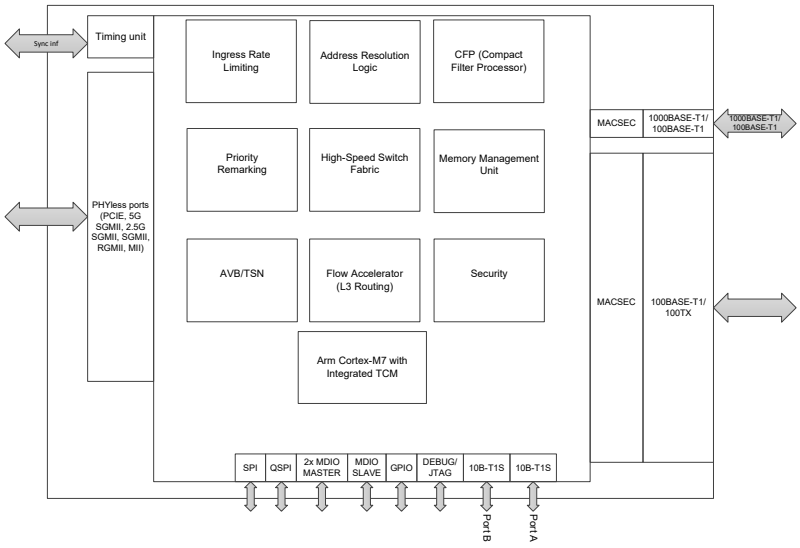
Architectural Features

- Enhanced architecture supports nonblocking, line-rate data transfer at wirespeed performance for all frame sizes over unshielded single-pair twisted cable.
- Integrated switch core has provisions for the integrated ARM Cortex-M7 processor and dedicated on-chip SRAM to send and receive frames.
- Processor subsystem able to support timing stack and Audio Video Broadcast (AVB) bridging support functions.
- Industry's first automotive switch with integrated 100BASE-T1 and 1000BASE-T1 IEEE 802.1AE MACsec PHYs.
- Support for TC10, Deep Sleep, and Passive Signal Detect power modes, which reduce power consumption to zero during periods of inactivity.
- Enhanced Layer 2/Layer 3 switching addressing new standardized Automotive Ethernet speeds:
  - Supports external IEEE 802.3cg 10BASE-T1S PHYs
  - Supports external IEEE 802.3ch multigigabit PHYs
- Integrated flow acceleration engines providing up to 4-Gb/s Layer 3 routing performance.
- Layer 2 anti-hack feature provides protection against common Layer 2 Ethernet attacks.
- Host connectivity through PCIe gen2 or 2.5G SGMII interfaces allows higher throughput between the host CPU and the switch. The high-speed PCIe interface with SRIOV virtualization allows OEMs to reduce overhead of multicore SoCs.

Product Family Features

- Specific architectural and design enhancements are utilized to increase design for test, reliability, and quality to surpass AEC-Q100 and EMC requirements.
- Designed to support IEEE 1588 and IEEE 802.1AS timing functions.

Functional Block Diagram



- Designed to support both peer-to-peer and end-to-end transparent clocking in hardware.
- Automotive cable diagnostics feature can detect pair open/ short and distance.

The BCM8957X family expands Broadcom's leadership in Automotive Ethernet switching technology by delivering an optimized solution for automotive applications requiring nonblocking switching performance.

Examples of applications requiring nonblocking switching include multiview advanced driver assist systems, where multiple cameras are connected to a switch in the electronic control unit (ECU), or an infotainment network where numerous multimedia endpoints are connected to a head unit.

The BCM8957X product family can interconnect with other devices for scalable, high-performance systems through multiple interfaces including PCIe, SGMII, RGMII, MII, and RMII.

Requirements such as high-precision stereo cameras, rear-seat entertainment units, and multichannel amplifiers are driving the need for adherence to quality of service requirements, specifically highly synchronized and accurate timing.

The BCM8957X devices support IEEE 1588 and IEEE 802.1AS timing functions designed for both peer-to-peer and end-to-end transparent clocking in hardware. In addition, the IEEE 802.1AS REV and IEEE 802.1Qci time-synchronization features are supported.

This product family delivers the most comprehensive automotive technology solution required by OEM and Tier-1 suppliers, meeting or exceeding CISPR 25 component-level, ISO 11452-5 Stripline, ISO 11452-4, IEC 61000-4-2, automotive Grade 2 temperature, AEC-Q100, and TS 16949 certifications.

Ordering Information

Part Number	Package	Ambient Temperature
BCM89571A0BCFBG BCM89572A0BCFBG	15-mm × 15-mm FBGA package, five integrated 100BASE-T1 PHYs, one integrated 1000BASE-T1 PHYs, and two uplink ports	Qualified to automotive Grade 2 temperature range (–40°C to +105°C)

BROADCOM®
connecting everything®

For more product information: broadcom.com

8957X-PB100 November 9, 2020