



Quad Integrated BroadR-Reach™ Power over Ethernet (PoE) Controller

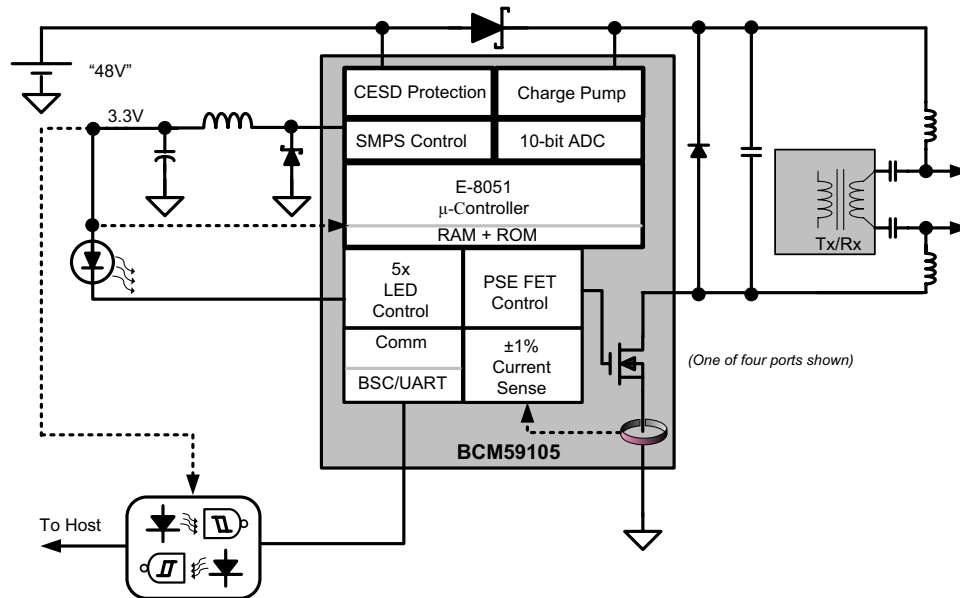
FEATURES

- **Standards support**
 - Supports IEEE 802.3at-2009 up to 100m
 - Supports Power over Ethernet (PoE) on BroadR-Reach™ up to 500m by extending basic IEEE PoE standards and concepts
 - Minimal changes required (only at front end) of most IEEE-compliant PDs
- **High hardware integration**
 - Integrated switches
 - Integrated current sense functionality
 - Integrated microcontroller
 - Integrated AC and DC disconnect options
- **Extensive hardware features**
 - Up to 25.5W into PD in standard IEEE 802.3at mode
 - Over 5W per port at 500m in BroadR-Reach mode
 - Programmable current limit
 - Low dissipation eliminating the need for a heat sink
 - Broadcom Serial Control (BSC) interface support to the host
 - UART interface support to the host
 - Robust switch protection circuit withstands Cable-Sourced Electrostatic Discharge (CESD) events
 - Autonomous, semi-autonomous, or manual modes
 - Real-time current, voltage, and temperature measurements available per port
 - Cascading of multiple devices (supporting up to 64 ports) with the option of single hardware and software interface for the host
 - Includes four LED drivers reporting PoE port activity
 - Integrated 3.3V buck regulator (DC:DC) to support up to 200 mA
 - Overtemperature protection
 - Operates from a single 48V supply
- **Extensive software features**
 - Self-contained power allocation software
 - Integrated 4-port power management
 - Integrated power management for all ports in cascaded version

SUMMARY OF BENEFITS

- **Enables new PoE services that require extended reach over one, two, and four pairs of either Cat3/5e or telephony grade cables**
- **Enables IP video/voice systems by enabling PoE over existing coax cable plants with a range of up to 500m**
- **Highest integration that allows for:**
 - Lowest total Bill of Materials (BOM) count
 - Easier Printed Circuit Board (PCB) placement and PCB area saving
 - Full functionality without external u-controller including power management
 - Eliminates the need for an external 48V to 3.3V power conversion
- **Further reduces BOM count via 3.3V DC:DC capability to be shared across multiple BCM59105 devices**
- **Eliminates the need for a heat sink due to the unique Rsense mechanism, resulting in the elimination of the external sense resistor**
- **Makes layout and design easy via simple ground/power plane**
- **Works with Broadcom PoE-enabled products for easy implementation**
- **Architected with system-oriented features to allow for system-level differentiation, including:**
 - Single point of interface for host hardware and software
 - Power management across all ports in cascaded configuration
 - Programmable current limits and dynamic measurement per port
 - Rapid power-down to support multiple power supply failures
- **Supports a variety of applications:**
 - BroadR-Reach applications
 - Routers and switches for Enterprise, SMB, SOHO, and commercial markets
 - Ethernet midspans
 - Power Source Equipment (PSE) power injectors
 - Integrated magnetics

OVERVIEW



BCM59105 Module Architecture

The BCM59105 is a highly integrated quad PSE controller compatible with BroadR-Reach technology. The controller extends the distance of PoE to 500m and can be used on a single twisted-pair, so that PoE, Ethernet, and IP services can be deployed over installed telephone wiring. The PSE controller can also be used with coax cable for IP video solutions that extend beyond 100m. The controller is the first in the industry to offer a highly integrated architecture with revolutionary enhancements that are targeted at reducing the complexity of PoE designs for BroadR-Reach applications.

The BCM59105 integrates the microcontroller, power switches, low-loss current sense function, detection, classification, and voltage converters 3.3V bias regulator (DC:DC converter) and AC disconnect functionality.

The high-level of integration and innovation make the device the most power efficient integrated IEEE 802.3at PoE system.

The BCM59105 offers a networking-oriented host interface that offers a full suite of power management. This easy to use interface can be extended to manage up to 64-cascaded ports through a single host interface.

The BCM59105 is designed with robustness and legacy support. It offers detection and classification mechanisms capable of detecting both IEEE 802.3at-compatible devices and legacy devices simultaneously. In addition, the BCM59105 is designed and tested to withstand cable discharge events as well as ESD events in excess of 2 kV.

The BCM59105 is a unique PSE controller that allows Broadcom to take advantage of both PoE and BroadR-Reach technology in the same solution. The controller integrates the microcontroller, power switches, low-loss current sense function, detection, and disconnect functionality. The high-level of integration and innovation make the device simple and easy to use for BroadR-Reach applications.

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59105-PB00-R 10/27/09

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