BCM5241
PRODUCT Brief

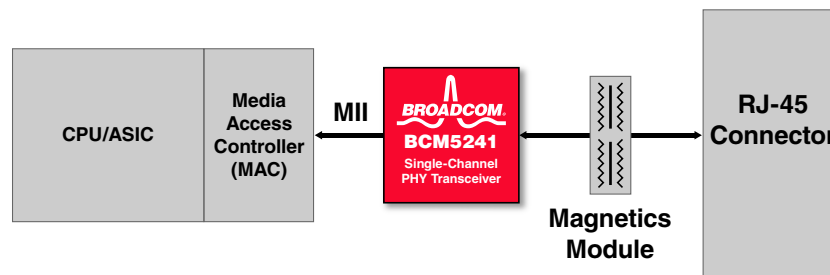# 10/100BASE-TX SINGLE-CHANNEL TRANSCEIVER

FEATURES

- **10BASE-T/100BASE-TX/100BASE-EFX IEEE 802.3u fast Ethernet transceiver**

- **HP auto-MDIX**

- **Advanced cable diagnostics (CableChecker™)**

- **Robust CESD tolerance**

- **Operation from a single 3.3V or 2.5V supply source**

- **Unique energy detect circuit**

- **Low-power mode**

- **Super isolate mode**

- **Cable length up to 160 meters**

- **MII and 7-wire serial interface**

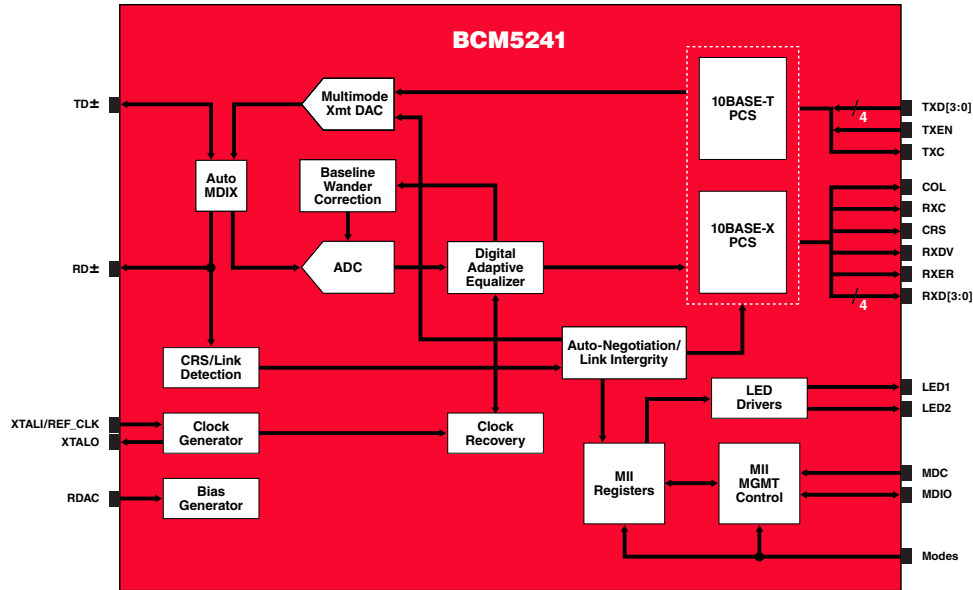- **Power dissipation: <170 mW**

SUMMARY OF BENEFITS

- **DSP-based architecture to ensure performance over temperature, voltage and process variation.**
    - Field proven in over one billion Fast Ethernet ports.
    - Superior ability to link and lower BER in marginal cable plants, relative to analog solutions.
    - Greater ATE coverage results in fewer field failures.

- **Improved ease of use and installation, reduced support cost.**
    - Straight-through or cross-over cables accommodated independent of installation.
    - Advanced cable diagnostic features to enable remote monitoring and debug of cabling infrastructure.
    - Resistance to CESD to reduce product destruction and product returns.

- **Flexible power supply options.**

- **Low power and intelligent power management.**
    - Increased active working time.
    - Prolonged battery life in active standby.
    - Increased reliability.

- **Control of network interaction on start up.**

BCM5241 System Diagram

BCM5241 Reference Design

DSP-Based PHY Technology

The BCM5241 builds on Broadcom's proven DSP PHY design and full custom circuit design techniques to create a highly-integrated and robust physical layer solution. DSP techniques allow the BCM5241 to achieve high interoperability and to exhibit robust performance across voltage (+/-10%), temperature, and process variations. Broadcom's DSP-based, Broad-Φ™ technology has been proven in the shipment of over one billion Fast Ethernet ports. Due to the significantly greater test coverage for a DSP based PHY, Broadcom's PHYs exhibit superior quality with a failure rate of well under 10 PPM.

Network Tolerance

The BCM5241 includes features that simplify the installation and maintenance of local area networks. A simple help tool is the CableChecker™, which enables basic cable issues to be resolved without contacting technical support. These issues include not plugging the cable correctly at one or both ends, identifying if the cable is damaged, or determining if the remote system is powered up.

Another network tolerance feature is the HP Auto-MDIX capability, which automatically detects and corrects crossed cables. With HP Auto-MDIX, the installer does not need to know what is on the other end of the network cable. The BCM5241 automatically switches its transmit and receive circuitry to accommodate the link partner's polarity.

Cable-sourced electrostatic discharge (CESD) is a recently discovered phenomenon that occurs when an electrically charged network cable is plugged into a networked product. This is an issue becoming more prevalent with recent cable installations. The BCM5241 has been designed and tested to withstand over 2KV of CESD, which unlike other transceivers, prevents the device from being destroyed in a CESD event.

Low Power Fast Ethernet PHY

The BCM5241 has an extremely low power dissipation of less than 170 mW. It features an integrated voltage regulator, and can be supplied by either 2.5V or 3.3V power sources. The BCM5241 employs several intelligent power-down states that conserve power, while allowing BCM5241-based products to automatically turn on when needed.

The BCM5241 includes a unique Intelligent Power-Management feature that powers down the device if energy is not detected on the cable. This feature is especially useful for portable and power-sensitive applications.

The BCM5241 can be set to periodically wake up at a user-defined interval, allowing the device to initiate keep-alive network traffic. For lowest power consumption, the BCM5241 can be put in a power-off state (<170 mW).

Applications

• Printers, multi-function peripherals • LAN on motherboard

• Game consoles   • IP Phones   • DTVs   • Wireless access points

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