

## 10/100BASE-TX SINGLE-CHANNEL SIGNI-PHY™ TRANSCEIVER

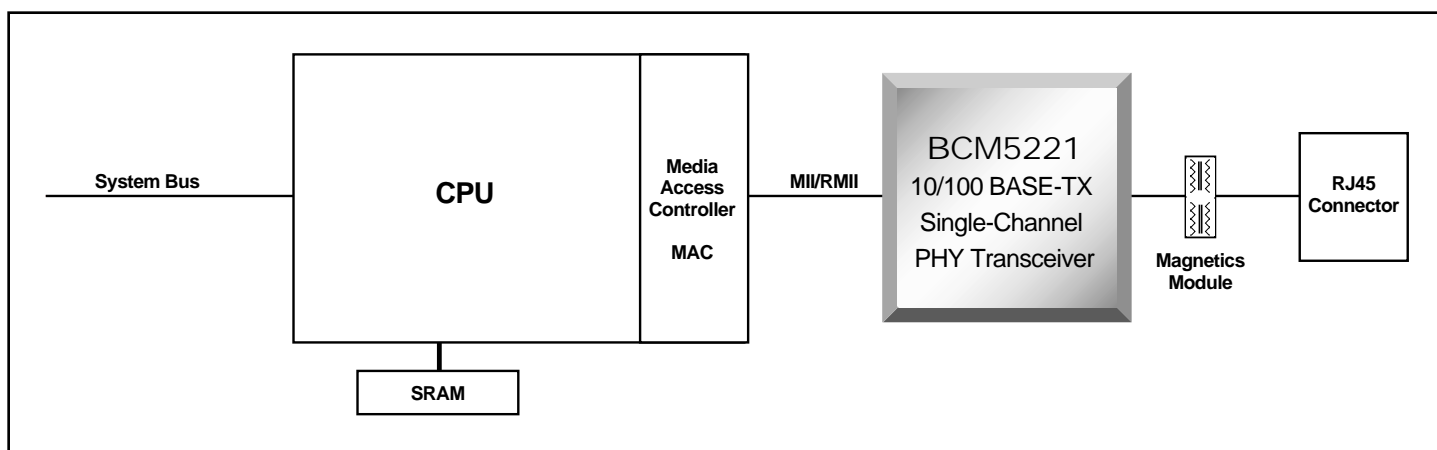
### BCM5221 FEATURES

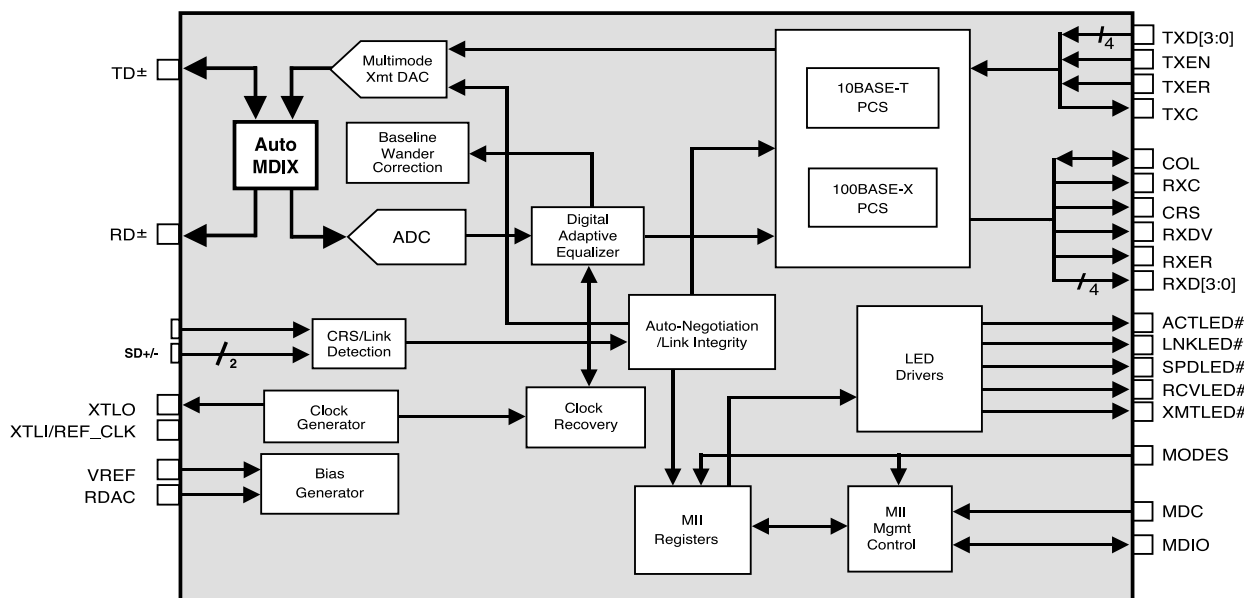
- **Power Supply: 2.5V or 3.3V**
- **Integrated Voltage Regulator to Allow Operation from a Single Supply Source**
- **Power Consumption: <275 mW**
- **Unique Energy Detection Circuit to Enable Intelligent Power Management**
- **HP Auto-MDIX**
- **Cable Length Indication**
- **Cable Noise Level Indication**
- **Robust CESD Tolerance**
- **Cable Length Greater Than 140 meters**
- **Well Under 10 PPM Defect Ratio Quality**
- **±10% Voltage Tolerance**
- **Industrial Temperature Range (-40 to 85C)**
- **MII and RMII Configurable**
- **IEEE 1149.1 (JTAG) Scan Chain Support**
- **MII Management Via Serial Port**
- **Layout-Compatible with BCM5201**
- **10BASE-T/100BASE-TX/FX IEEE 802.3u Fast Ethernet Transceiver**
- **Glueless TX-to-FX Media Conversion**
- **64-pin TQFP or 64-pin BGA Package**

### SUMMARY OF BENEFITS

- **Low power and intelligent power management**
  - Increased active working time
  - Prolonged battery life in active standby
  - Increased reliability
- **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
- **DSP-based Signi-PHY™ architecture to ensure performance over temperature, voltage and process variation**
  - Proven in over 100,000,000 Fast Ethernet ports
- **Faster design turn-around with BCM5201 layout compatibility**
- **Ease of manufacturing with JTAG support**
- **Fully integrated TX/FX PHY transceiver (MII/RMII-to-TX magnetics or FX optics)**
  - Lower system cost
  - Simplified system and board design

### Embedded 10/100 BASE-TX Application





## Lowest-Power Fast Ethernet PHY

With a power dissipation of 250 mW, the **BCM5221** is the industry's lowest-power Fast Ethernet PHY. It features an integrated voltage regulator, and can be supplied by either a 2.5V or 3.3V power source. In addition, the **BCM5221** has several intelligent power-down states that conserve power, yet allow products based on it to automatically turn on when needed.

The **BCM5221** 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 such as laptop LAN card adapters. The **BCM5221** allows PCMCIA or CardBus adapters to remain plugged in and draw virtually no energy even if the client is no longer connected to the network. Because most laptop users do not remove their LAN PC card when working remotely, this feature results in a noticeably extended battery life for laptop computer users.

The **BCM5221** can be set to periodically wake up at a user-defined interval, allowing the product to initiate keep-alive traffic on the network. For lowest power consumption, the **BCM5221** can be put in a power-off state (<2.5 mW).

## Network Tolerance

The **BCM5221** includes features that simplify the installation and maintenance of local area networks. One such 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:

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5221-PB01-R-4.1.02

the **BCM5221** 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, an issue becoming more prevalent with recent cable installations. The **BCM5221** has been designed and tested to withstand over 5K V of CESD, which unlike other transceivers prevents the device from being destroyed in a CESD event.

## DSP-Based PHY Technology

The **BCM5221** 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 **BCM5221** to achieve high interoperability and to exhibit robust performance across voltage (+/-10%), temperature (-40 to 85C), and process variations. Broadcom's DSP-based, Digi-PHY™ technology has been proven in the shipment of over 100,000,000 Fast Ethernet ports. Broadcom's superior quality has resulted in a failure rate well under 10 PPM.

## Applications

Applications for the **BCM5221** that take advantage of its low power and high network tolerance:

- PCMCIA/CardBus Cards
- LAN on Motherboard
- IP Phones
- Cable Modems
- Set-Top Boxes
- Print Servers
- Wireless Access Points
- Embedded Telecom



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