

# MCF5272

## Cost-Effective Virtual Private Network (VPN) Router

### Overview

A VPN router securely connects a group of two or more computer systems to a private local area network (LAN) that communicates over the Internet. To ensure network privacy and data integrity, the router should support user authentication mechanisms, data encryption/decryption and firewall technologies. A VPN router may be used as a cost-effective network router for small office/home office (SOHO) applications, providing a gateway and firewall for dial-up, cable or asymmetrical digital subscriber line (ADSL) Internet connections.

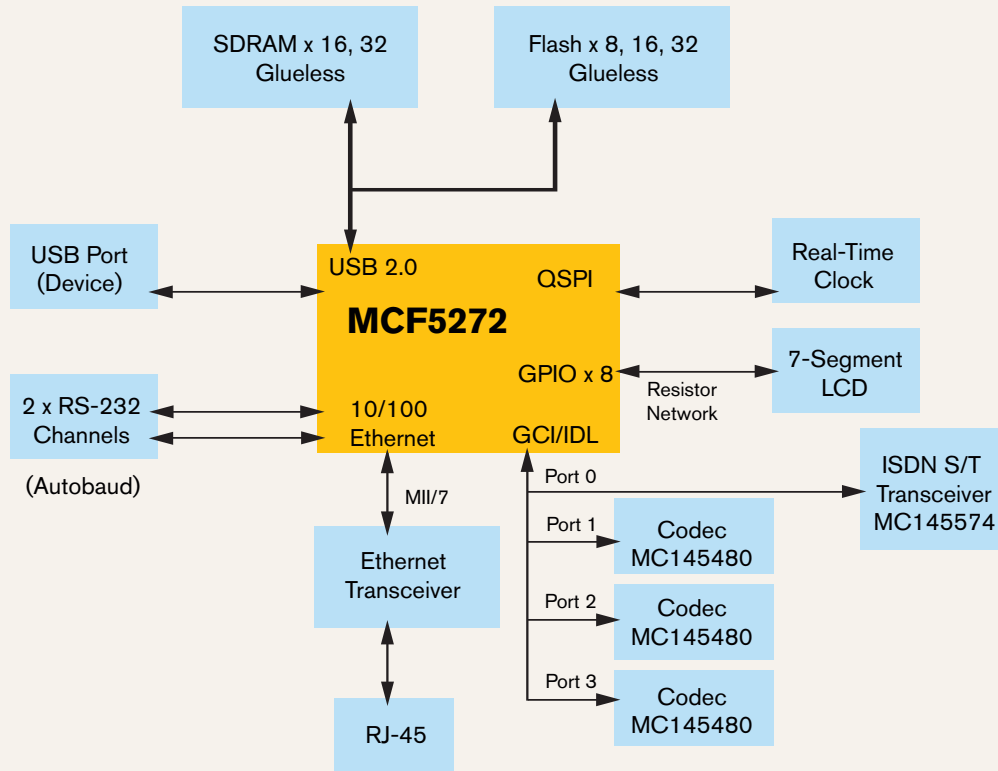


### Design Challenges

Embedded network devices not only perform their own specific control functions; they also need to perform additional control functions by interacting over a network. Devices connected to the network, particularly the Internet, take on a range of functionality. For example, they should be capable of handling standard protocols,

such as TCP/IP and its associated application set, in addition to handling authorization and access issues. In the design of a network, systems must adhere to a set of protocols for addressing, identifying hosts, routing, establishing connections and contention on the network, and sending data.

## MCF5272 BLOCK DIAGRAM



### **Freescale Solution**

Freescale Semiconductor's family of ColdFire® microprocessors provides the ideal networking solution. The MCF5272 microprocessor, based on a Version 2 (V2) ColdFire core, is designed with integrated peripherals widely used in communications applications.

The design is centered around the ability of the MCF5272 to handle 100 Base-T Ethernet, 12 Mbps Universal Serial Bus (USB), an Integrated Services Digital Network (ISDN) transceiver, three codec channels and

two serial ports, while leaving more than 50 percent of the CPU bandwidth to run user applications such as router software. In addition to using the communications interfaces on the MCF5272, general-purpose input/output (GPIO) is used to drive a seven-segment LCD display. The queued serial peripheral interface (QSPI) module is used to interface to a real-time clock to provide time stamping on the data as it is routed. Incoming serial data tends to vary in terms of data rate. The RS-232 channels are designed to lock to this data and to automatically track and

respond at the incoming data rate. HDLC firmware is provided in the on-chip ROM of the MCF5272. The user can use the HDLC protocol for virtually any of the communication channels in the router—particularly the codec and ISDN interfaces. The Ethernet Media Access Controller (MAC) designed into the MCF5272 requires an external transceiver and magnetics to provide 10 or 100 Base-T operation via the MII interface.

**Learn More:** For more information about Freescale products, please visit [www.freescale.com](http://www.freescale.com).