CIRRUS LOGIC ®

FEATURES

- **Single-Chip IEEE 802.3 Ethernet Controller**
- **Maximum Current Consumption = 55 mA (5V Supply)**
- **3 V Operation**
- **Industrial Temperature Range**
- **Comprehensive Suite of Software Drivers Available**
- **Efficient PacketPage™ Architecture Operates in I/O and Memory Space and as DMA Slave**
- **Direct Bus Interface**
- **Full Duplex Operation**
- **On-Chip RAM Buffers Transmit and Receive Frames**
- **10BASE-T Port with Analog Filters, Provides:**
  — Automatic Polarity Detection and Correction
- **AUI Port for 10BASE2, 10BASE5, and 10BASE-F**
- **Programmable Transmit Features:**
  — Automatic Re-transmission on Collision
  — Automatic Padding and CRC Generation

(cont.)

Crystal LAN™ Ethernet Controller

OVERVIEW

The CS8900A is a true single-chip, full-duplex, Ethernet solution, incorporating all of the analog and digital circuitry needed for a complete Ethernet circuit. Major functional blocks include: a direct bus interface; an 802.3 MAC engine; integrated buffer memory; a serial EEPROM interface; and a complete analog front end with both 10BASE-T and AUI.

The CS8900A is a low-cost Ethernet LAN Controller optimized for embedded applications and Per-

(cont.)

Functional Block Diagram

NOV '01
PI271PP2
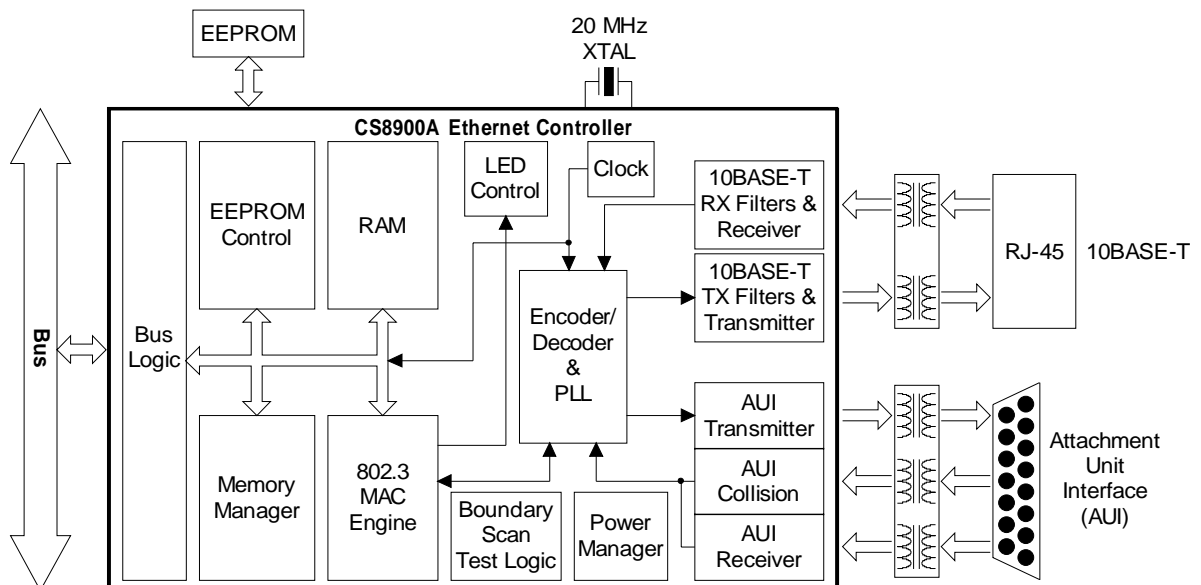
FEATURES (Continued from Page 1)

- **Programmable Receive Features:**
  — Stream Transfer™ for Reduced CPU Overhead
  — Auto-Switch Between DMA and On-Chip Memory
  — Early Interrupts for Frame Pre-Processing
  — Automatic Rejection of Erroneous Packets
- **EEPROM Support for Jumperless Configuration**
- **Boot PROM Support for Diskless Systems**
- **Boundary Scan and Loopback Test**
- **LED Drivers for Link Status and LAN Activity**
- **Standby and Suspend Sleep Modes**
- **All the most popular drivers are available, including:**
  — LINUX
  — Microsoft
    - NDIS 2 DOS driver
    - NDIS 2 OS/2 driver
    - NDIS 3 drivers for Windows NT, Windows for Workgroups, Windows 95, and Windows CE

- **Novell**
- **ODI DOS driver**
- **ODI OS/2 driver**
- **ODI Server**
- **Packet Driver (TCP/IP)**
- **pSOS**
- **Real-time OS drivers**
- **RIPL (Remote Initial Program Load) for ODI and NDIS 2**
- **RTOS/NCOS (ARM and Oracle) - In development**
- **SCO**
- **Setup/installation Utility: EEPROG Utility (EEPROM programming utility)**
- **UNIX**
- **VxWorks**

NOTE: To inquire about additional drivers, see "*Ordering Information*" on page 3

OVERVIEW (Continued from Page 1)

sonal Computers. Its highly-integrated design eliminates the need for costly external components required by other Ethernet controllers. The CS8900A includes on-chip RAM, 10BASE-T transmit and receive filters, and a direct Bus interface with 24 mA Drivers.

In addition to high integration, the CS8900A offers a broad range of performance features and configuration options. Its unique PacketPage architec-ture automatically adapts to changing network traffic patterns and available system resources. The result is increased system efficiency. The CS8900A is available in a 100-pin TQFP package ideally suited for small form-factor, cost-sensitive Ethernet applications. With the CS8900A, system engineers can design a complete Ethernet circuit that occupies less than 1.5 square inches (10 sq. cm) of board space.

Contacting Cirrus Logic Support

For a complete listing of Direct Sales, Distributor, and Sales Representative contacts, visit the Cirrus Logic web site at:
http://www.cirrus.com/corporate/contacts/

OVERVIEW (cont.)

Key Benefits

Very Low Cost

The CS8900A is designed to provide the lowest-cost Ethernet solution available for embedded applications, portable motherboards, and adapter cards. Cost-saving features include:

- **Integrated RAM eliminates the need for expensive external memory chips.**
- **On-chip 10BASE-T filters allow designers to use simple isolation transformers instead of more costly filter/transformer packages.**
- **The serial EEPROM port, used for configuration and initialization, eliminates the need for expensive switches and jumpers.**
- **The CS8900A is designed to be used on a 2-layer circuit board instead of a more expensive multi-layer board.**
- **The 8900A-based solution offers the smallest footprint available, saving valuable printed circuit board area.**
- **A set of certified software drivers is available at no charge, eliminating the need for costly software development.**

High Performance

The CS8900A is a full 16-bit Ethernet controller designed to provide optimal system performance by minimizing time on the bus and CPU overhead per frame. It offers equal or superior performance for less money when compared to other Ethernet controllers. The CS8900A's PacketPage architecture allows software to select whichever access method is best suited to each particular CPU/bus configuration. When compared to older I/O-space designs, PacketPage is faster, simpler and more efficient.

To boost performance further, the CS8900A includes several key features that increase throughput and lower CPU overhead, including:

- **StreamTransfer cuts up to 87% of interrupts to the host CPU during large block transfers.**
- **Auto-Switch DMA allows the CS8900A to maximize throughput while minimizing missed frames.**
- **Early interrupts allow the host to preprocess incoming frames.**
- **On-chip buffering of full frames cuts the amount of host bandwidth needed to manage Ethernet traffic.**

Low Power and Low Noise

For low power needs, the CS8900A offers three power-down options: Hardware Standby, Hardware Suspend, and Software Suspend. In Standby mode, the chip is powered down with the exception of the 10BASE-T receiver, which is enabled to listen for link activity. In either Hardware or Software Suspend mode, the receiver is disabled and power consumption drops to the micro-ampere range.

In addition, the CS8900A has been designed for very low noise emission, thus shortening the time required for EMI testing and qualification.

Complete Support

The CS8900A comes with a suite of software drivers for immediate use with most industry standard network operating systems. In addition, complete evaluation kits and manufacturing packages are available, significantly reducing the cost and time required to produce new Ethernet products.

Ordering Information

CS8900A-CQ, 0° to 70° C, 100-pin TQFP

CS8900A-IQ, -40° to 85° C, 100-pin TQFP

CS8900A-CQ, 30° to 70° C, 100-pin TQFP

CRD8900A-1 Evaluation Kit

If you have any questions, please contact the undersigned by phone or by email.

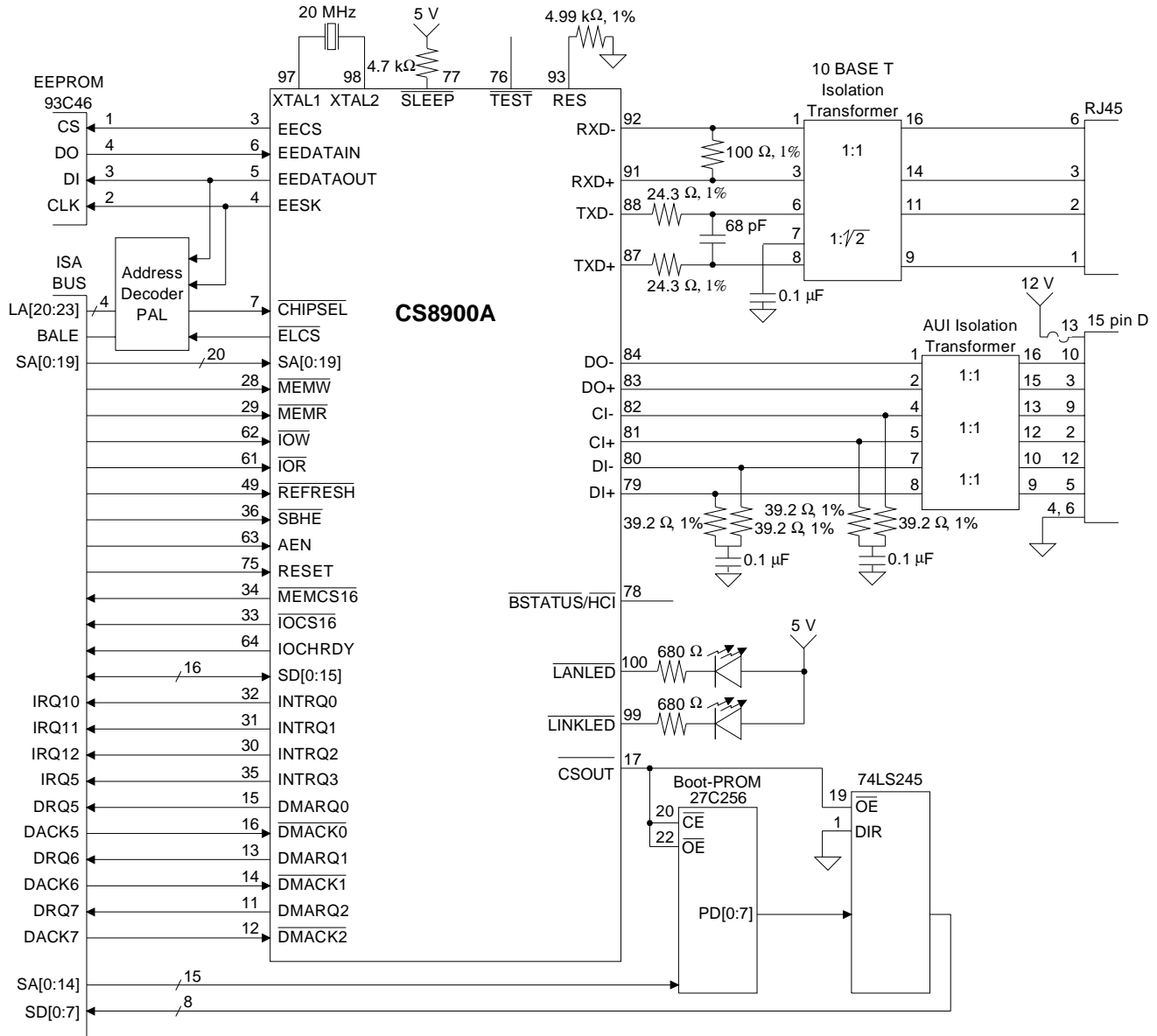www.cirrus.com/support/ or Field Applications Engineers.

Schematic & Layout Review Service

Confirm Optimum
Schematic & Layout
Before Building Your Board.

For Our Free Review Service
Call Applications Engineering.

C a l l : (5 1 2) 4 4 5 - 7 2 2 2

Figure 1 Typical Connection Diagram