LAN7500
Hi-Speed USB 2.0 to 10/100/1000 Gigabit Ethernet Controller

SMSC's LAN7500 is a Hi-Speed USB 2.0 to 10/100/1000 Gigabit Ethernet controller providing a high-performance and cost-effective USB to Ethernet connectivity solution. The LAN7500 contains an integrated 10/100/1000 Gigabit Ethernet PHY, USB PHY, Hi-Speed USB 2.0 device controller, 10/100/1000 Gigabit Ethernet MAC, TAP controller, EEPROM controller and a FIFO controller with a total of 32KB internal packet buffering. The device supports 10BASE-T, 100BASE-TX and 1000BASE-T Ethernet and implements Control, Interrupt, Bulk-in and Bulk-out USB endpoints. The Ethernet controller supports auto-negotiation, auto-polarity correction, HP Auto-MDIX* support and is compliant with IEEE 802.3/802.3u/802.3ab standards.

USB-based networking provides flexibility for the routing and placement of network connections anywhere in the system. USB-based solutions leverage the existing USB stack for the Ethernet driver. The LAN7500 is also available with a wide range of drivers including Windows®, Mac® and Linux®.

The LAN7500 also offers SMSC's NetDetach™ and UniClock™ technologies. NetDetach allows for up to a 25% reduction in power by enabling the host CPU to enter a low-power state when Ethernet is inactive. UniClock simplifies the clocking scheme and reduces system BOM cost by using a single 25MHz crystal for both USB and Ethernet connectivity. Multiple power management features are provided, including various low-power modes and Magic Packet™, Wake-on LAN (WOL) and Link Status Change wake events. These wake events can be programmed to initiate a USB remote wakeup. The device is available in commercial (0º to 70ºC) and industrial temperature range (-40º to 85ºC) options.

SMSC's complimentary and confidential LANCheck® and USBCheck™ online design review services are available for customers who have selected our products for their application design-in**.

Highlights

- Single-chip, Hi-Speed USB 2.0 to 10/100/1000 Gigabit Ethernet controller
- Implements NetDetach technology for reduced system power consumption
- Supports EEPROM-less operation for reduced BOM costs
- Requires only a single 25MHz crystal
- Easy upgrade for USB-based 10/100 Ethernet (LAN9500/9500A) to 10/100/1000 Gigabit Ethernet
- Supports IEEE 802.3/802.3u/802.3ab standards
- Industrial temperature range option available (LAN7500i)
- 8x8mm, 56-pin QFN, lead-free RoHS-compliant package

Target Applications

- Embedded Systems
- Consumer Electronics Devices
- Netbooks/Smartbooks/MIDs
- Docking Stations
- Digital TVs (DTVs)
- Set-top Boxes
- Personal Video Recorders (PVRs)
- Network Printers
- USB Port Replicators
- Stand-alone USB to Ethernet Dongles
- Industrial Designs

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Key Features

Benefits

Key Features	Benefits
NetDetach technology	Allows CPU to enter low-power state when Ethernet is inactive
UniClock technology utilizing a single 25MHz crystal	Reduces BOM component count and cost
Multiple Operating Systems supported: Windows 7, Windows XP, Windows Vista®, Windows CE, PXE, DOS ODI, Mac and Linux.	Diverse applications supported
PME pin wake-up support	Reduces system power requirements
Supports TCP segmentation offload and full hardware TxRx check-sum offloads (IPV4, IPV6, TCP, UDP)	Reduces CPU loading

LAN7500 Block Diagram
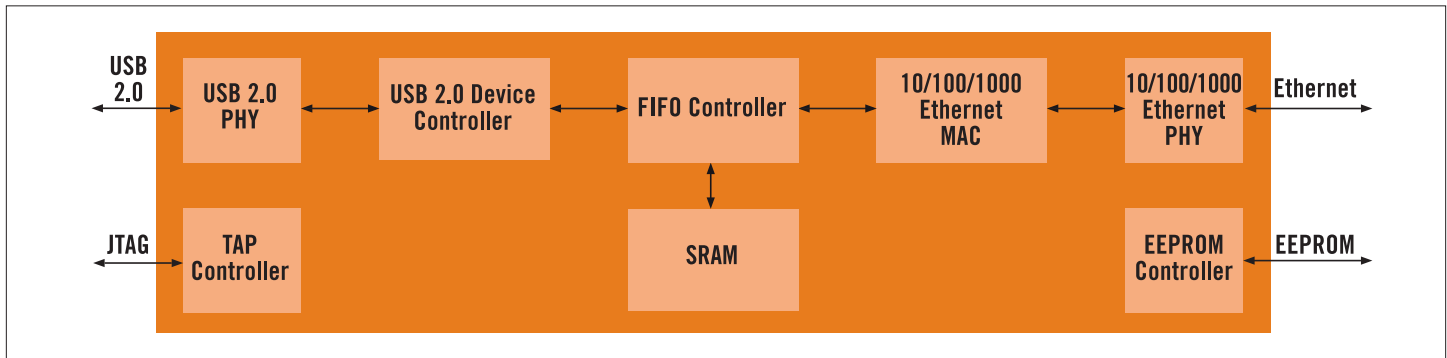
LAN7500 Application Diagram
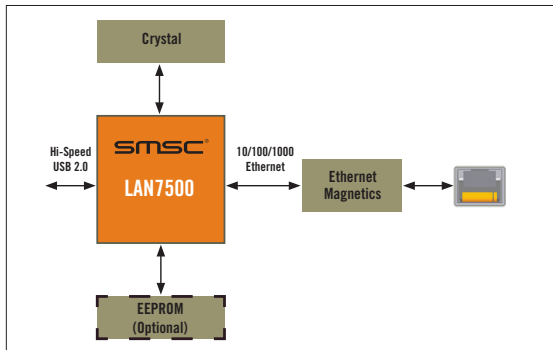
LAN7500 Target Applications

Which USB to Ethernet Controller is Right for Your Design?

	Ethernet	Host Interface	NetDetach Technology	UniClock Technology	Industrial Temp Option (-40° to 85°C)	Pin & Package
LAN7500	10/100/1000	USB 2.0	Yes	Yes	LAN7500i	56-pin QFN
LAN9500A	10/100	USB 2.0	Yes	Yes	LAN9500Ai	56-pin QFN

LAN9500A is SMSC's USB 2.0 to 10/100 Ethernet product with NetDetach and UniClock technologies in a small 56-pin QFN package

*HP Auto-MDIX eliminates the need for special "crossover" cables when connecting LAN devices together.
**LANCheck and USBCheck online design review services require an SMSC e-Services account and are subject to the terms and conditions listed on SMSC's website.

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