LAN951x Family

Industry's First Single-Chip, Hi-Speed USB 2.0 Hub and High-Performance 10/100 Ethernet Controllers

SMSC's LAN951x is the industry's first family of fully-integrated, Hi-Speed USB 2.0 hub and high-performance 10/100 Ethernet controllers. The LAN951x is specifically designed to provide system architects with a low-cost, power-efficient, small-footprint USB to Ethernet and multi-port USB connectivity solution in a single package.

The LAN951x contains a Hi-Speed USB 2.0 hub with two (LAN9512), three (LAN9513) or four (LAN9514) fully-integrated downstream USB 2.0 PHYs, an integrated upstream USB 2.0 PHY, a 10/100 Ethernet MAC/PHY controller and an EEPROM controller. It offers SMSC's highest level of USB 2.0 and 10/100 Ethernet compliance and interoperability. Additionally, the LAN951x devices simplify system design by leveraging the existing USB stack and reducing the PCB footprint by up to 65% compared to discrete competitive solutions. USB-based networking technology offers a cost-effective and smart design alternative to traditional PCI/PCI-Express networking solutions due to the flexibility of routing and placement of Ethernet and USB connectivity ports.

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

- Fully-integrated, 2/3/4-port Hi-Speed USB 2.0 hub and 10/100 Ethernet controllers
- SMSC's UniClock™ technology simplifies the clocking scheme and reduces system BOM cost by using a single 25MHz crystal for both USB and Ethernet connectivity – without the need for extra components when adding USB hubs
- Built-in ±8kV/15kV contact/air discharge ESD protection on both USB and Ethernet PHYs
- 24MHz clock out provided to connect additional USB Hubs
- Multiple Operation Systems supported including: Windows® 7, Windows XP, Windows Vista®, Windows CE, Windows Mobile®, Linux® and Mac®, among others
- Industrial temperature range (-40° to 85°C) options available (LAN9512i/9513i/9514i)

- Compact 9x9mm, RoHS-compliant, 64-pin QFN package
- EEPROM-less design option helps to reduce BOM costs
- Hub features:
  - Two (LAN9512), three (LAN9513) or four (LAN9514) USB 2.0 downstream ports
  - Dedicated Transaction Translator (TT) for each downstream port for higher data throughput in mixed-speed USB environments
  - Unique PHYBoost technology enables programmable four-level USB signal drive strengths in downstream port transceivers
- Ethernet features:
  - 10/100 Ethernet controller supports numerous power management wakeup features, including Magic Packet™, Wake-on LAN (WOL) and Link Status Change

Target Applications

- Docking Stations
- Netbooks and Ultra-mobile PCs (UMPCs)
- Mobile Internet Devices (MIDs)
- Gaming Consoles
- Portable Consumer Devices

- Digital TVs (DTVs)
- Blue-ray Disc™ Players
- Set-top Boxes (STBs)
- Network Printers
- Embedded Systems

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Key Features

Benefits

Key Features	Benefits
Single-chip 10/100 Ethernet controller and Hi-Speed USB 2.0 hub	Reduces system cost when both USB and Ethernet connectivity are required
Dedicated TT for each USB downstream port	Provides maximum USB throughput for each connected device when operating with mixed-speed peripherals
USB PHYBoost technology	Facilitates restoration of USB signal integrity which is impacted by poor PCB layout, long cable and other system level variables
Single crystal design for USB and Ethernet; EEPROM-less design option	Reduces BOM cost and PCB space
24MHz clock out	If the system requires an additional USB hub, then the cost of an additional crystal can be saved
Ethernet power save mode	System SoC power can be saved by enabling additional power save modes if the link is down or Ethernet is not active

Application Examples

Universal Docking Station: The LAN9514 can be designed into a USB docking station for laptops; provides USB port expansion for Ethernet, video, audio, I/O and other optional USB connectivity.
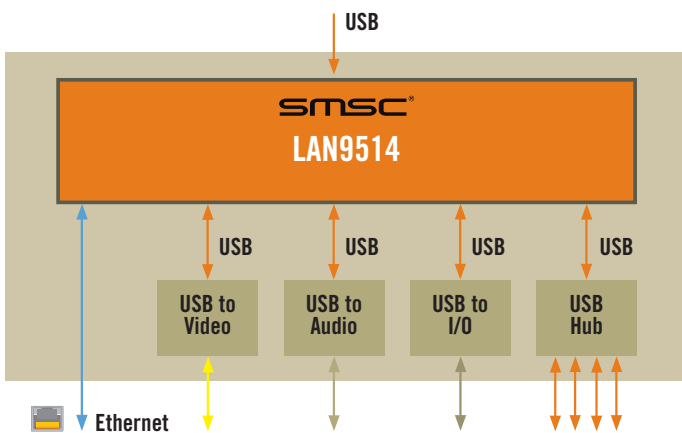
Internal DTV Solution: The LAN9512 can be used to provide 10/100 Ethernet and two additional USB 2.0 ports to DTV applications. It provides a clean interface to the DTV's SoC and reduces the SoC pin-count for peripheral connectivity.
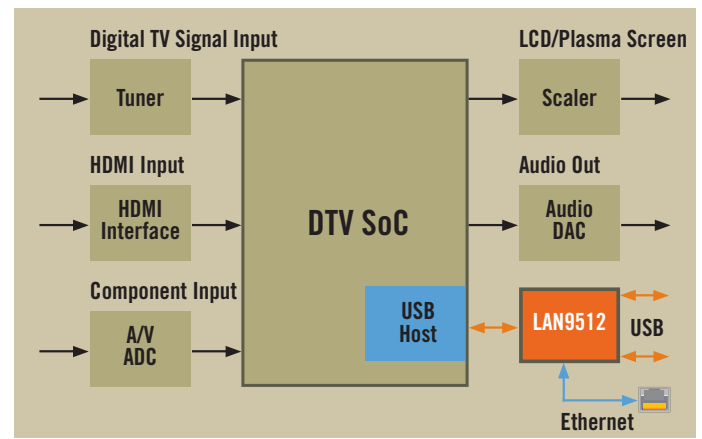
LAN951x Family Block Diagram
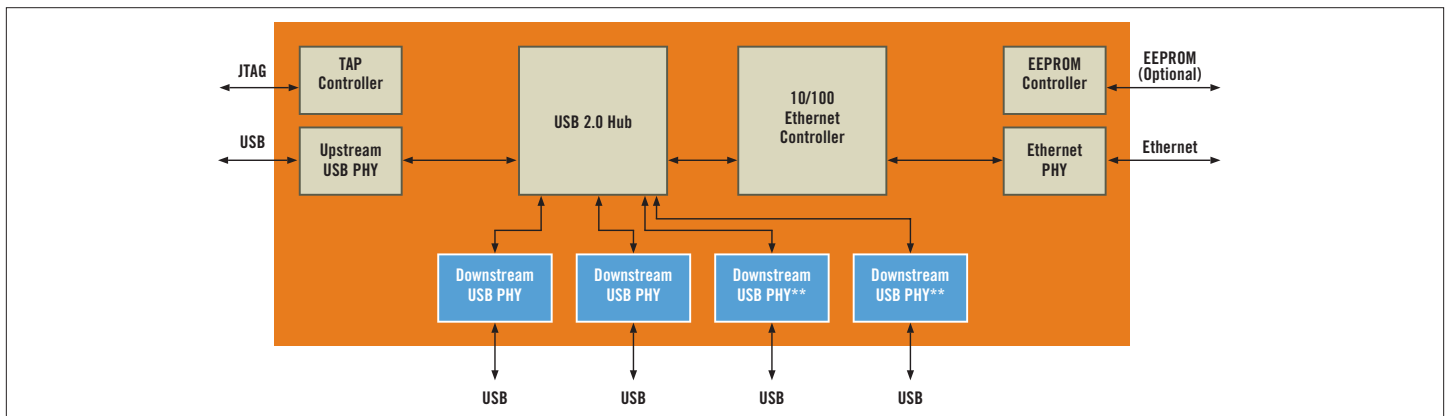
*LANCheck and USBCheck online design review services are subject to the terms and conditions listed on SMSC's website and require an SMSC e-Services account.
**LAN9514 only

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