VSC7421-04
17-Port Layer 2 Gigabit Ethernet Switch with 12 Fully Integrated Copper PHYs

Microsemi's next-generation switch device delivers the industry's lowest power GbE switching solution.

VSC7421-04 is the industry's first fully integrated 17-port Gigabit Ethernet switch with eight copper PHYs in a single package. In conjunction with Microsemi's 4-port VSC8514-03 or VSC8664-03 devices, a 17-port switch can be designed using only two ICs.

The device leverages Microsemi's 65 nm technology, resulting in one of the most cost-effective and lowest power consumption solutions in the industry. It includes the most advanced Ethernet energy efficiency features for bringing green technology solutions to market.

A rich set of Ethernet switching features, such as Layer 2 forwarding with VLAN and QoS processing, enables the delivery of differentiated services. The VSC7421-04 device contains an 8051 CPU for light management of the switch.

A comprehensive application software package is provided for LED control, loop indication, device overheat protection, and other enhanced functions.
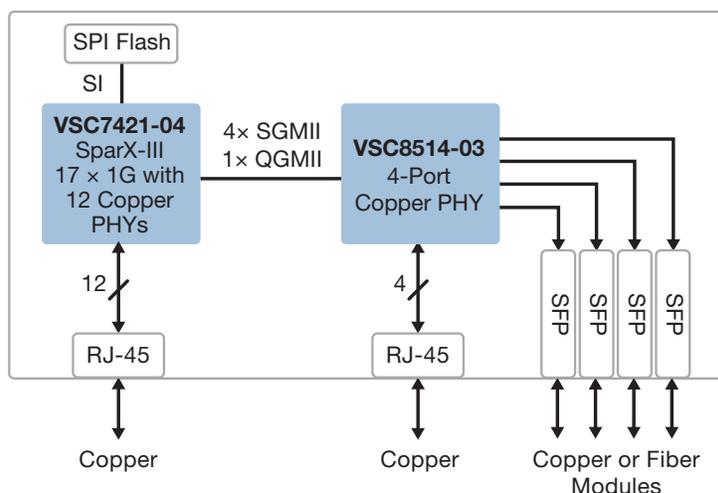
Highlights

- Supports IEEE 802.3az and green energy efficiency modes with ActiPHY™ and PerfectReach™
- Lowest BOM solution requires only one IC
- One QSGMII MAC interface and up to four SGMII ports with 100 Mbps and 1 Gbps fiber support

Applications

- Unmanaged and Lightly Managed Ethernet switches
- Industrial switches and routers
- Customer premises equipment (CPE) and outdoor equipment
- VPN, firewall, and UTM appliances

VSC7421-04 in a 16-Port 1-Gigabit Industrial Switch Application

Best-In-Class Power Consumption

- Lowest power 17-port Gigabit Ethernet switch available in the market
- Green energy efficiency modes including ActiPHY™, Perfect-Reach™, and Draft IEEE 802.3az
- Two ICs reduce overall power requirements
- Optimal power consumption for all link speeds

Features

- Twelve integrated IEEE 802.3ab-compliant 10/100/1000BASE-T Ethernet copper transceivers with VeriPHY™ cables diagnostics
- Two configuration options: 12 × CuPHY + 2 × 1G SGMII + 2 × 1G/2.5G SGMII, 12 × CuPHY + 1× QGMII + 1 × 1G/2.5G SGMII
- Integrated 250 MHz 8051 CPU with 64 KB internal storage
- Serial interface for external CPU register access
- Device overheat protection
- Hardware loop detection
- Integrated fan controller
- 8 K MAC addresses and 4 K VLAN support
- Push/pop VLAN tag
- Supports IEEE 1149.1 JTAG boundary scan, IEEE 1149.6 JTAG, 1 Gbps SGMII, and 100BASE-FX and 1000BASE-X

Layer 2 Switching

- 17-port Gigabit Ethernet switch with nonblocking wire-speed performance
- Link aggregation (IEEE 802.3ad) with programmable traffic distribution based on Layer 2 through Layer 4 information
- Wire-speed hardware-based learning and CPU-based learning configurable per port
- Independent and shared VLAN learning
- Jumbo frame support up to 12.2 kilobytes with per-port programmable MTU
- Provider Bridging (VLAN Q-in-Q) support (IEEE 802.1ad)
- 4 megabits of integrated shared packet memory

QoS

- Eight QoS queues per port with strict or deficit-weighted round robin scheduling
- QoS classification based on IEEE 802.1p and IPv4/IPv6 DSCP
- Data rate shaper and policer per-queue, per-port for both ingress and egress directions
- Full-duplex flow control (IEEE 802.3x) and halfduplex backpressure, symmetric and asymmetric
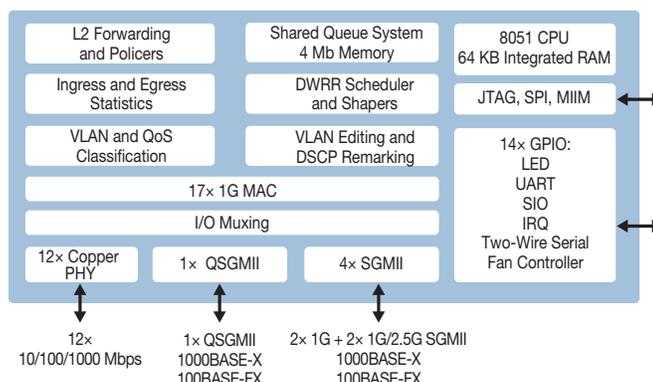- Multicast and broadcast storm control with flooding control

Key Specifications

- 1 V core power supply
- 2.5 V I/O power supplies
- 24 mm × 24 mm thin QFP package
- –40 °C to 125 °C temperature range

Related Products

Visit www.microsemi.com for information about these related products:
- Ethernet switches
- 1G copper PHYs
- MACs

L2 Forwarding and Policers	Shared Queue System 4 Mb Memory	8051 CPU 64 KB Integrated RAM
Ingress and Egress Statistics	DWRR Scheduler and Shapers	JTAG, SPI, MIIM
VLAN and QoS Classification	VLAN Editing and DSCP Remarking	14× GPIO: LED UART SIO IRQ Two-Wire Serial Fan Controller

17× 1G MAC

I/O Muxing

12× Copper PHY | 1× QSGMII | 4× SGMII

12× 10/100/1000 Mbps

1× QSGMII 1000BASE-X 100BASE-FX

2× 1G + 2× 1G/2.5G SGMII 1000BASE-X 100BASE-FX