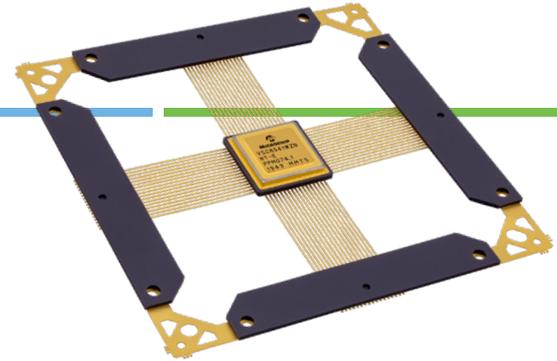


VSC854xRT Radiation-Tolerant Ethernet PHY

Single-Port, Fast, Gigabit Ethernet Copper PHY With MII, RMII, GMII and RGMII



Summary

The VSC8541RT is a radiation-tolerant, single-port gigabit Ethernet copper PHY with Media-Independent Interface (MII), Reduced MII (RMII), Gigabit MII (GMII) and Reduced Gigabit MII (RGMII). The VSC8541RT withstands the harsh aerospace environments with enhanced radiation performance and high reliability in extreme temperatures and vacuums.

Targeting space-constrained 10/100/1000BASE-T applications in both ceramic and plastic packages, the VSC8541RT supports the widest range of LVCMOS levels for a parallel Media Access Control (MAC) interface and the MDIO/MDC interface.

VSC8541RT Key Features

Superior PHY and Interface Technology

- Integrated 10/100/1000BASE-T Ethernet copper transceiver (IEEE® 802.3ab compliant) with the industry's only non-TDR-based VeriPHY™ cable diagnostics algorithm
- Patented line driver with low EMI voltage mode architecture and integrated line-side termination resistors
- Wake-on-LAN using magic packets
- HP Auto-MDIX and manual MDI/MDIX support
- MII, RMII, GMII and RGMII for MAC
- Jumbo frame support up to 16 Kilobytes with programmable synchronization FIFOs

Synchronous Ethernet and IEEE 1588 Time Stamp Support

- Recovered clock output with programmable clock squelch control for G.8261 Synchronous Ethernet applications
- 1000 BASE-T ring resiliency feature to switch between master and slave timing without dropping link
- Clock output squelch to inhibit clocks during auto-negotiation and no link status
- Clause 45 registers to support IEEE 802.3bf
- IEEE 1588 Start of Frame (SOF) detection to enhance 1588v2 PTP time stamp accuracy

Fast Link Up/Link Drop Modes

- Fast link failure indication (<1 ms typical, programmable down to <10 μ s)
- Supports 1000BASE-T forced mode for both master and slave end point configurations with constant link self-monitoring and link auto-reset should the link come down

Best-In-Class Power Consumption

- EcoEthernet v2.0 green energy efficiency with ActiPHY, PerfectReach and IEEE 802.3az energy-efficient Ethernet
- Fully optimized power consumption for all link speeds
- Clause 45 registers to support energy-efficient Ethernet

Key Specifications

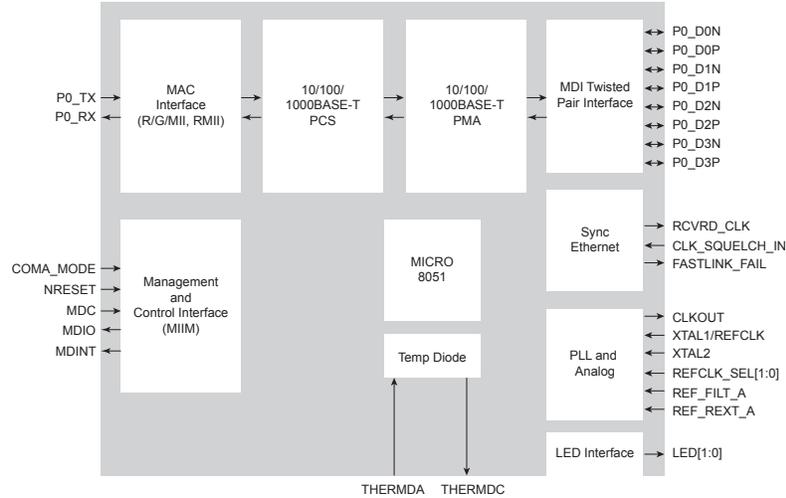
- Compliant with IEEE 802.3 (10BASE-T, 100BASE-TX, and 1000BASE-T) specifications
- Supports MII, RMII, GMII and RGMII
- Supports 1.5, 1.8, 2.5 and 3.3V CMOS for RGMII versions 1.3 and 2.0 (without HSTL support), GMII/MII and RMII version 1.2
- Supports 25 MHz XTAL and 25/50/125 MHz OSC clock sources
- Supports programmable output frequencies of 25, 50 or 125 MHz regardless of chosen XTAL or OSC frequencies
- Supports a wide array of stand-alone hardware configuration options
- Supports all five bits of MDIO/MDC addressing possible for managed-mode designs using pull-up/pull-down resistors
- Optionally reports if a link partner is requesting in-line Power over Ethernet (PoE and PoE+)

Space Environment

- Full wafer lot traceability
- 68-pin hermetic ceramic CQFP package
- Space-grade screening and qualification
- Total ionizing dose: up to 100 krad (Si), QML and ESCC)
- Heavy ions and protons test
- Single event latch-up LET > 78 MeV.cm²/mg
- SEU full characterization for all functional block

HiRel/New Space Application

- Full wafer lot traceability
- 68-pin plastic VQFN package
- QML-N/AQEC/AEC-Q100 equivalent
- Unitary burn-in and temperature cycling (opt.)
- Qual pack documentation
- Single lot date code



VSC8540RT

The Radiation-Tolerant, Single-Port, Fast Ethernet Copper PHY

Targeting space-constrained 10/100BASE-T applications in both ceramic and plastic packages, the VSC8540RT is a radiation-tolerant, single-port, fast Ethernet copper PHY with RGMII/MII/RMII interfaces that withstands the harsh aerospace environments with enhanced radiation performance and high reliability in extreme temperatures and vacuums. With its equivalent feature set, VSC8540RT is the radiation-tolerant Ethernet PHY solution for customers not requiring gigabit capabilities.

VSC8541 Evaluation Kit

Tool	Part Number
VSC8541 Evaluation Board	VSC8541EV

Product Selection Guide

Part Number	Package	Interface	Ethernet Bandwidth	Quality Flow
VSC8541WZBRT-E	CQFP68	GMII/RGMII/MII/RMII	10/100/1000 Mbps	Engineering Sample
VSC8541WZBRT-MQ				QML-Q Equivalent
VSC8541WZBRT-SV				QML-V Equivalent
VSC8541XMVRT-HP	VQFN68			HiRel Plastic (HP)
VSC8540WZBRT-E	CQFP68	RGMII/MII/RMII	10/100 Mbps	Engineering Sample
VSC8540WZBRT-MQ				QML-Q Equivalent
VSC8540WZBRT-SV				QML-V Equivalent
VSC8540XMVRT-HP	VQFN68			HiRel Plastic (HP)