

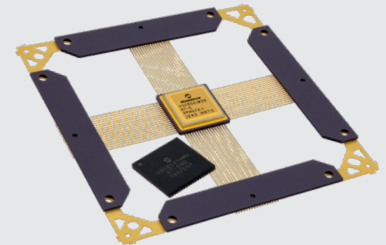
# VSC854xRT Radiation Tolerant Ethernet PHY

Single-Port Fast/Gigabit Ethernet Copper PHY With GMII/RGMII/MII/RMII Interfaces

## Summary

The VSC8541RT is a radiation-tolerant single-port Gigabit Ethernet copper PHY with GMII/RGMII/MII/RMII interfaces. The VSC8541RT withstands the harsh aerospace environment with enhanced radiation performances, extreme temperature, vacuum and high reliability.

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 MAC interface as well as 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
- RGMII/GMII/MII/RMII MAC interface
- 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
- 1000Base-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  $\mu$ 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

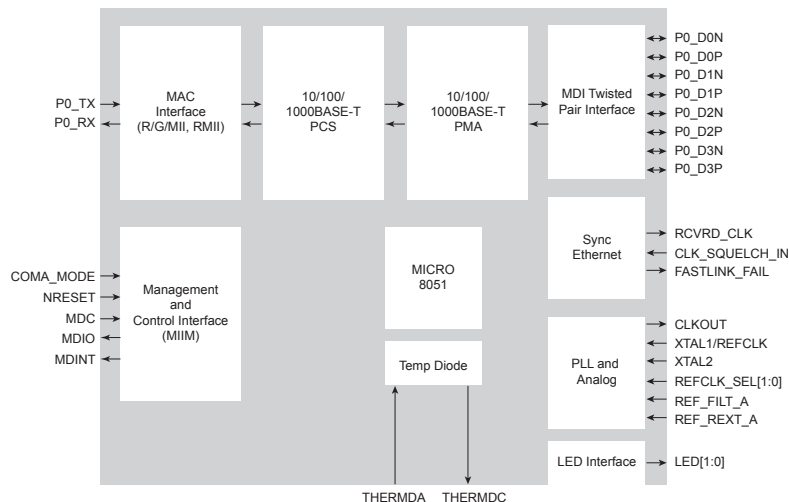
- Compliant with IEEE 802.3 (10BASE-T, 100BASE-TX, and 1000BASE-T) specifications
- Supports R/G/MII
- Supports 1.5, 1.8, 2.5 and 3.3V CMOS for RGMII versions 1.3 and 2.0 (without HSTL support), GMII/MII as well as RMII version 1.2
- Supports 25 MHz Xtal and 25/50/125 MHz OSC clock sources
- Supports 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 5 bits of MDIO/MDC addressing possible for managed mode designs using pull-up/pull-down resistors
- Optionally reports if a link partner is requesting inline Power over Ethernet (PoE and PoE+)

## Space Environment

- Full wafer lot traceability
- 68 pins hermetic ceramic CQFP package
- Space-grade screening and qualification
- Total ionizing dose: up to 100krad (Si), QML & ESCC
- Heavy ions and protons test
- Single event latch-up LET > 78 MeV.cm<sup>2</sup>/mg
- SEU full characterization for all functional block

## Hirel/New Space Application

- Full wafer lot traceability
- 68 pins 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 withstands the harsh aerospace environment with enhanced radiation performances, extreme temperature, vacuum and high reliability. With VSC8541RT 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)

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