



# DUAL-PORT, TRI-SPEED 10GBASE-T / 1000BASE-T / 100BASE-TX ETHERNET PHYSICAL LAYER DEVICE

## INTRODUCTION

The TN2022 is an integrated dual-port, triple-speed 10 Gigabit Copper PHY. With XFI, XAUI, and SGMII switch-interface support, auto-negotiated triple-speed line support, and integrated dual-ports, the TN2022 is ideal for multiple applications: Dense 24- and 48-port switches for data centers, 10G switch uplinks, and 10GBase-T NIC/Adapter cards for servers.

## FEATURES HIGHLIGHTS

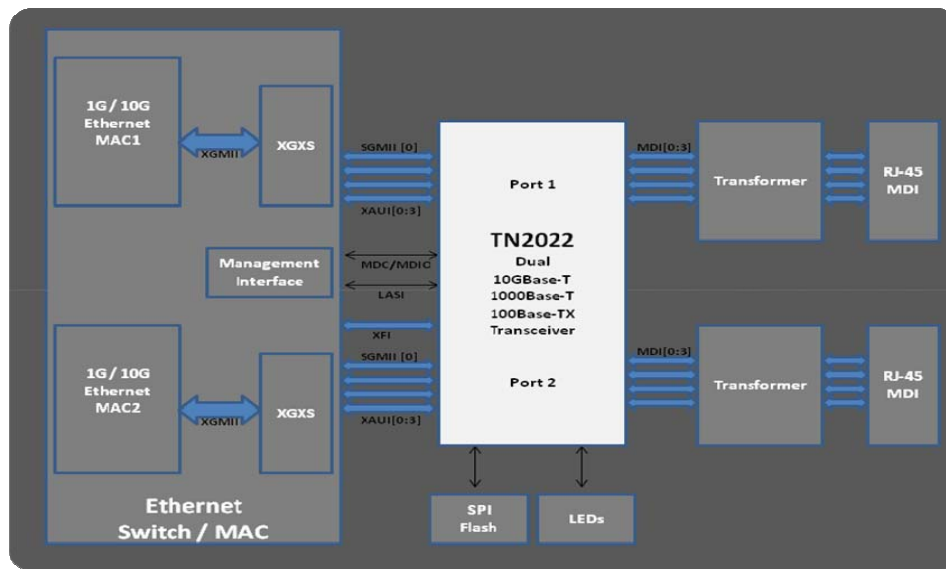
- Dual Port 10GBase-T Ethernet PHY integrated into Single Chip
- Fully IEEE 802.3an-2006 compliant
- 100m 802.3an compliant cable reach
- Auto-negotiated Triple-speed operation:
  - 10GBase-T
  - 1000Base-T
  - 100Base-TX
- Flexible MAC/Switch interface:
  - 10G XFI or XAUI, 3.125G
  - 1G SGMII - 1 lane, 1.25G

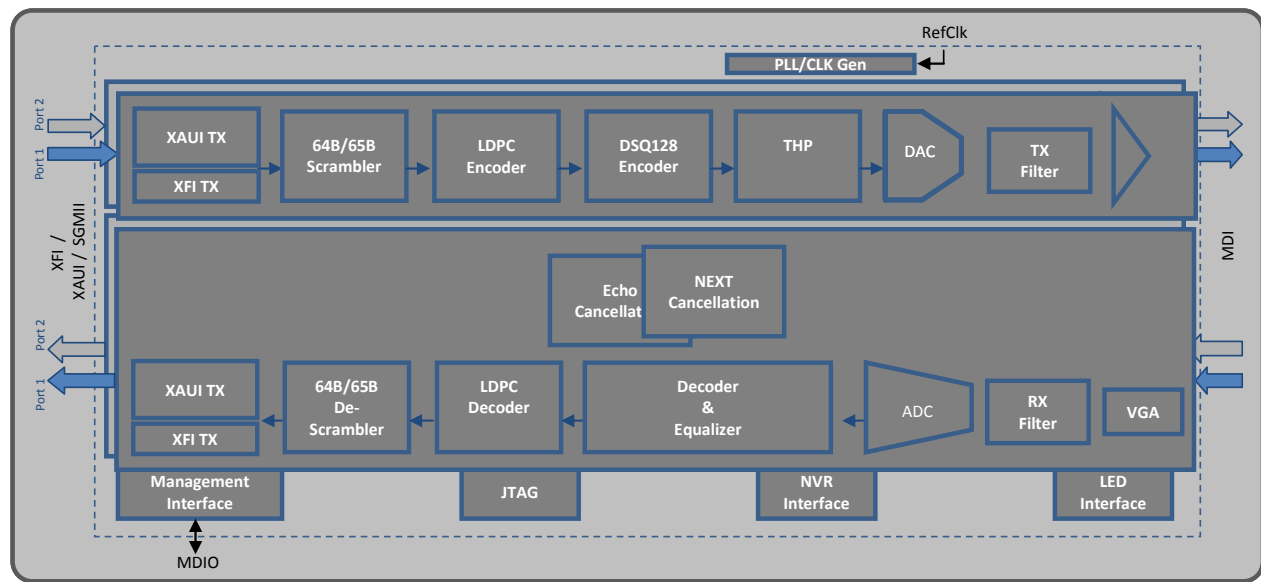
- Detection/Correction of wiring pair or polarity swaps
- IEEE 1149.1 (JTAG) boundary scan
- Compact 25x25mm BGA packaging for DUAL ports
- Cable Monitoring diagnostics
- Low Power: 5.7W/port @ 100m; 4W/port @ 30m
  - Adaptive Voltage Scaling for optimal power efficiency

## TN2022 BENEFITS

- Low Power enables dense 10G applications
- Single chip with efficient, compact packaging offers efficient board space utilization.
- Triple-speed operation enables compatibility with existing installed base, with added upgrade path to increased bandwidth.
- 10G XAUI or XFI switch/MAC interface enables compatibility with existing and next-generation dense 10G applications.
- Cable diagnostics enables fault detection, BER measurements, and pair skew measurements for immediate cable characterization.

TN2022: System Block Diagram for Typical 10G Connectivity





TN2022 Block Diagram

## OVERVIEW

The TN2022 is an integrated dual-port, triple-speed single-chip 10 Gigabit Ethernet Copper Physical Layer (PHY) device. Fully IEEE 802.3an compliant, the TN2022 is ideal for 10 Gigabit Ethernet data transport over conforming structured copper cable up to 100m. Key features include low power and small footprint, supporting adapter card application requirements through to dense 10G switch applications.

Each port of the TN2022 offers auto-negotiated triple-speed operation: 10GBase-T / 1000Base-T / 100Base-TX, enabling legacy IEEE Ethernet compliance, compatibility with existing installed base, and providing a seamless upgrade path to increased bandwidth.

The TN2022 provides system interface flexibility with 4-lane XAUI or 1-lane XFI support for 10G

applications and 1-lane SGMII support for 1G applications on the system side.

The TN2022 incorporates various advanced features for ease of design and performance monitoring. The Cable Diagnostics features enables fault detection and BER/skew management. Multiple loopback modes are supported for verification and debugging.

Integrating two 10 Gigabit Ethernet ports into a single-chip makes the TN2022 ideal for ease of design in dual-port adapter card applications and dense 10 Gigabit Ethernet switch designs.

The Dual-Port TN2022 10GBase-T Ethernet PHY is part of a family of 10 Gigabit Ethernet Physical Layer (PHY) devices offered by Teranetics. Teranetics offers a family of single and dual port solutions based on application requirements.

## ABOUT TERANETICS

Teranetics provides state-of-the-art silicon solutions that enable 10 Gigabit rates over the traditional UTP and STP copper cabling; an order of magnitude improvement over rates available in today's enterprise networks. Teranetics products allow data centers and enterprise networks to increase scalability and improve throughput while dramatically lowering the cost of ownership for 10 Gigabit links. Teranetics solutions are being adopted by many of the networking industry's leading OEMs and equipment providers.

### Corporate Headquarters

2665 North First Street  
Suite 300  
San Jose, CA 95134

Tel: 408.457.2200  
Fax: 408.321.8758

[www.Teranetics.com](http://www.Teranetics.com)  
[sales@Teranetics.com](mailto:sales@Teranetics.com)