

# TN9510

## 5-speed 10GBase-T / NBASE-T (™) Network Adapter Card

Low Power - Low Area - Low Cost

### 10 Gigabit Performance, More than 1G over legacy cables!

Designed to support high-volume enterprise wireless local-area network (WLAN) OEM systems requiring multi-Gigabit Ethernet connectivity, such as 802.11ac Wave 2 wireless access points, the TN9510 adapter reference design offers a low-power, small form factor and low cost solution enabling pervasive NBASE-T connectivity. NBASE-T technology boosts the speed of broadly deployed Cat5e twisted pair copper cabling up to 100 meters in length well beyond the designed limits of 1Gbps.

### Overview

The TN9510 Network Adapter reference design hosts the latest Tehuti TN4010 controller, an optimized 10GbE controller designed for low-power, low-cost, single-port applications. The TN4010 MAC is paired with the Aquantia AQRate® AQR105 transceiver, a single-port, low power, high performance NBASE-T PHY. The Tehuti adapter reference design supports auto-negotiation allowing the NBASE-T solution to optimally select the best speed: 10 Gigabit Ethernet (10GbE), 5 Gigabit Ethernet (5GbE), 2.5 Gigabit Ethernet (2.5GbE), 1Gigabit Ethernet (GbE) or 100 Megabit Ethernet (100MbE) over Cat5e/Cat6 or better cabling.

### Key Features

- Low Cost, Low Power, 10 Gigabit performance in a low profile PCIe form factor
- IEEE 802.3an 10G, 1G and 100M over up to 100m of Cat6a (or better) cables
- PCI Express Gen-2 x4 Host Bus Interface
- 16K Jumbo Frames
- IP, TCP, UDP checksum offloading
- RMON statistics
- IEEE 802.1Q Tagged VLAN
- Virtual NIC support
- Reduced CPU utilization and improved throughput

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Features	Benefits
<b>PCI Express Host Bus Interface</b> <ul style="list-style-type: none"> <li>• PCI Express Rev 2.0 specification (5 GT/s)</li> </ul>	<ul style="list-style-type: none"> <li>• Standard high performance bus interface</li> <li>• Supports x4, x2, x1 lanes</li> </ul>
<b>Reduced System complexity</b> <ul style="list-style-type: none"> <li>• 1Mbit internal memory</li> <li>• Internal OTP</li> </ul>	<ul style="list-style-type: none"> <li>• No on-board DRAM required</li> <li>• No Flash/EEPROM required on board</li> </ul>
<b>Ethernet and Media support</b> <ul style="list-style-type: none"> <li>• Full IEEE Std 802.3ae Compliant</li> <li>• NBASE-T Alliance draft specification compliant</li> <li>• 10G/5G/2.5G/1000M/100M auto negotiation support</li> <li>• Jumbo frame support (16K)</li> <li>• IEEE 802.1q VLAN support</li> <li>• RFC2819 RMON MIB statistics</li> <li>• Multicast</li> <li>• IEEE 802.3ad Link Aggregation support</li> </ul>	<ul style="list-style-type: none"> <li>• 10Gb/s over unshielded twisted pair (UTP)</li> <li>• Backward compatibility for wide range of systems</li> <li>• Higher network utilization for large data transfers</li> <li>• Traffic isolation for security</li> <li>• Generic statistics monitoring</li> <li>• Reduce network traffic</li> <li>• Maximize network throughput via teaming</li> </ul>
<b>OptiStrata™ Accelerator Engine</b> <ul style="list-style-type: none"> <li>• Integrated OptiStrata™ Processor</li> </ul>	<ul style="list-style-type: none"> <li>• Flexibility in implementing packet processing algorithms and supporting future TCP/IP stack implementations</li> </ul>
<b>Performance enhancements</b> <ul style="list-style-type: none"> <li>• Microsoft Scalable Networking</li> <li>• Receive-side scaling (RSS)</li> <li>• MSI</li> <li>• IP, TCP and UDP checksum offloading</li> <li>• Large Send (up to 64 KB)</li> <li>• Low Latency (&lt; 4 uS)</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced host bus traffic</li> <li>• Efficiently support multi-core systems</li> <li>• Minimize overhead and eliminates interrupt sharing</li> <li>• Lower CPU utilization</li> <li>• Increased network throughput</li> <li>• Ideal for high performance computing applications</li> </ul>
<b>Driver support</b> <ul style="list-style-type: none"> <li>• Microsoft Windows Server 2012, Microsoft Windows Server 2012 R2</li> <li>• Microsoft Windows Server 2008 R2</li> <li>• Microsoft Hyper-V</li> <li>• Microsoft Windows 10 Pro Insider Preview 64 bit</li> <li>• Microsoft Windows Win 8.1 32/64 bit</li> <li>• Microsoft Windows Win 7 32/64 bit</li> <li>• Linux 2.6.x, Linux 3.x</li> <li>• vmware® ESXi 5.x, ESXi 6.0</li> <li>• Apple OS X 10.10.3 or later</li> </ul>	<ul style="list-style-type: none"> <li>• Short time to market</li> <li>• Seamless software integration</li> <li>• No interference with existing TCP/IP implementations</li> <li>• Advanced multi-processor platforms support</li> </ul>
<b>Manageability</b> <ul style="list-style-type: none"> <li>• Advanced cable diagnostics</li> <li>• Comprehensive Built-In self-test</li> </ul>	<ul style="list-style-type: none"> <li>• On the field cable and network connection debug</li> <li>• Improves yield, increases reliability, and lowers overall cost</li> <li>• Optimizing system management &amp; thermal design</li> </ul>
<b>Physical and Electrical</b> <ul style="list-style-type: none"> <li>• Voltage: 3.3V</li> <li>• Power consumption (Full bidirectional traffic, 100m cable): <ul style="list-style-type: none"> <li>10G speed: 6.41W</li> <li>5G speed: 4.83 W</li> <li>2.5G speed: 3.97W</li> <li>1G speed: 2.94W</li> <li>100M speed: 2.21W</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Operating Temperature 0 ÷ C to 70 ÷ C</li> <li>• Storage Temperature -40 ÷ C to 85 ÷ C</li> <li>• Green &amp; RoHS Compliant</li> <li>• Size: 82mmX62mm</li> </ul>