**Expresso 4.0 Core**

The Northwest Logic Expresso 4.0 core is designed for maximum performance and ease of use for PCI Express (PCIe) 4.0 applications. It is backwards compatible with PCIe 3.0/2.1/1.1 specifications.

**Expresso 4.0 Block Diagram**

**Highlights**
- x16, x8, x4, x2, x1 lane support
- 1-8 Physical Function support
- SR-IOV support up to 255 Virtual Functions
- Endpoint, Root Port, Upstream Switch Port, Downstream Switch Port, Bifurcation support
- 32, 64, 128 and 256-bit core width support
- Transaction Layer (TL), Partial TL interface bypass options
- Fully validated

**Protocol Compatibility**

<table>
<thead>
<tr>
<th>Standards</th>
<th>Data Rates (Gbps)</th>
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<tbody>
<tr>
<td>PCIe 4.0</td>
<td>16, 8, 5, 2.5</td>
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**Deliverables**
- Core (source code)
- Testbench (source code)
- Complete documentation
- Expert technical support
- Maintenance updates

**Overview**

Northwest Logic Expresso 4.0 core is designed for maximum performance and ease of use for PCIe 4.0 applications. It is backwards compatible with PCIe 3.0/2.1/1.1 specifications.

The Expresso 4.0 Core separately, or in combination with the Northwest Logic family of DMA cores and DMA drivers, provides the maximum system throughput on a PCIe link.

The core is specifically designed for ease of use including full receive packet decoding, complete error handling, automatic handling of PCIe message packets and comprehensive system-debug and link monitoring support.

The core is delivered integrated and verified with the user’s target PHY. A complete list of supported PHYs is available on request. To accelerate simulations, the core is also delivered integrated with a fast-simulating behavioral PHY.

The core is provided with the Expresso Testbench which provides a PCIe Bus Functional Model.

The core is compliant with the current version of the PCIe Base Specification 4.0. The core has been extensively validated with the Avery Design Systems PCI-Xactor PCIe Compliance Suite and Northwest Logic Expresso Testbench.

IP Core customization services are also available.
PCI Express Solution

*Options include the Expresso DMA Bridge core, DMA Back-End core or AXI DMA Back-End core

PCI Express Platform
Rambus, joined by the team at Northwest Logic, offers a complete solution for PCIe applications.

Features
- High-performance, easy-to-use core
- PCIe 4.0 specification compliant; backward compatible with PCIe 3.0/2.1/1.1
- x16, x8, x4, x2, x1 lane support
- 16, 8, 5 and 2.5 Gbps SERDES support
- 1-8 Physical Function support
- SR-IOV support with up to 255 Virtual Functions
- Endpoint, Root Port, Upstream Switch Port, Downstream Switch Port, Bifurcation support
- 32, 64, 128, and 256-bit core width support
- Transaction Layer (TL), Partial TL interface bypass options
- AER, ECRC, MSI-X, MSI, Lane Reversal support, L1 PM substates, SRIS, ECC/Parity Protection
- Delivered integrated and verified with target PCIe PHY
- Fully validated
- Source code available
- Customization and integration services available