BROADCOM®

Data Sheet

# BCM957504-N425G

## Quad-Port 25 Gb/s SFP28 Ethernet PCI Express 4.0 x16 OCP 3.0 SFF Network Adapter

## General Description

The Broadcom® BCM957504-N425G is a quad-port 25 Gb/s PCI Express 4.0 x16 network adapter designed to the Open Compute Project (OCP) 3.0 Design Specification in small form factor with four SFP28 network connectors. The adapter supports SFP28/SFP+ optical modules and copper direct-attach cables. The network adapter uses the Broadcom BCM57504 100GbE MAC controller with an integrated quad-channel 25GbE SFI transceiver.

## Features

- Quad-port pluggable media interface, compatible with a SFP28/SFP+ optical transceiver or a copper direct-attach cable.
- Industry's most secure PCIe adapter solution leveraging Broadcom's BroadSAFE® technology.
- Multi-Host up to four hosts.
- Fully compliant with the SFF-8402 standard.
- x16 PCI Express 4.0 compliant.
- SR-IOV with up to 1K virtual functions (VFs).
- Function-Level Reset (FLR) support.
- TruFlow™ flow processing engine.
- VXLAN, NVGRE, Geneve, GRE encap/decap.
- vSwitch Acceleration.
- Tunnel-aware stateless offloads.
- DCB support – PFC, ETS, QCN, DCBx.
- RDMA over Converged Ethernet (RoCE)
- Network Controller Sideband Interface (NC-SI).
- SMBus 2.0.
- MCTP over SMBus.
- Jumbo frames up to 9 KB.
- Advanced congestion avoidance.
- Multiqueue, NetQueue, and VMQ.
- IPv4 and IPv6 offloads.
- TCP, UDP, and IP checksum offloads.
- Large send offload (LSO).
- Large receive offload (LRO).
- TCP segmentation offload (TSO).
- Receive-side scaling (RSS).
- Transmit-side scaling (TSS).
- VLAN insertion/removal.
- Interrupt coalescing.
- Network boot – PXE, UEFI.
- iSCSI boot.
- Wake-on-LAN (WOL).
- MSI and MSI-X.
- OCP 3.0 FRU support.
- Conforms to the OCP 3.0 Design Specification Version 1.00.

## Applications

Quad-Port 25-Gigabit SFP28 Ethernet adapter for OCP systems.

**Figure 1: BCM957504-N425G OCP 3.0 SFF Network Adapter**



**NOTE:** Figure 1 shows the pull-tab bracket installed by default. The surface markings of the component may not reflect the product upon receipt. Broadcom reserves the right to change any component on the printed circuit board with the same functionality.

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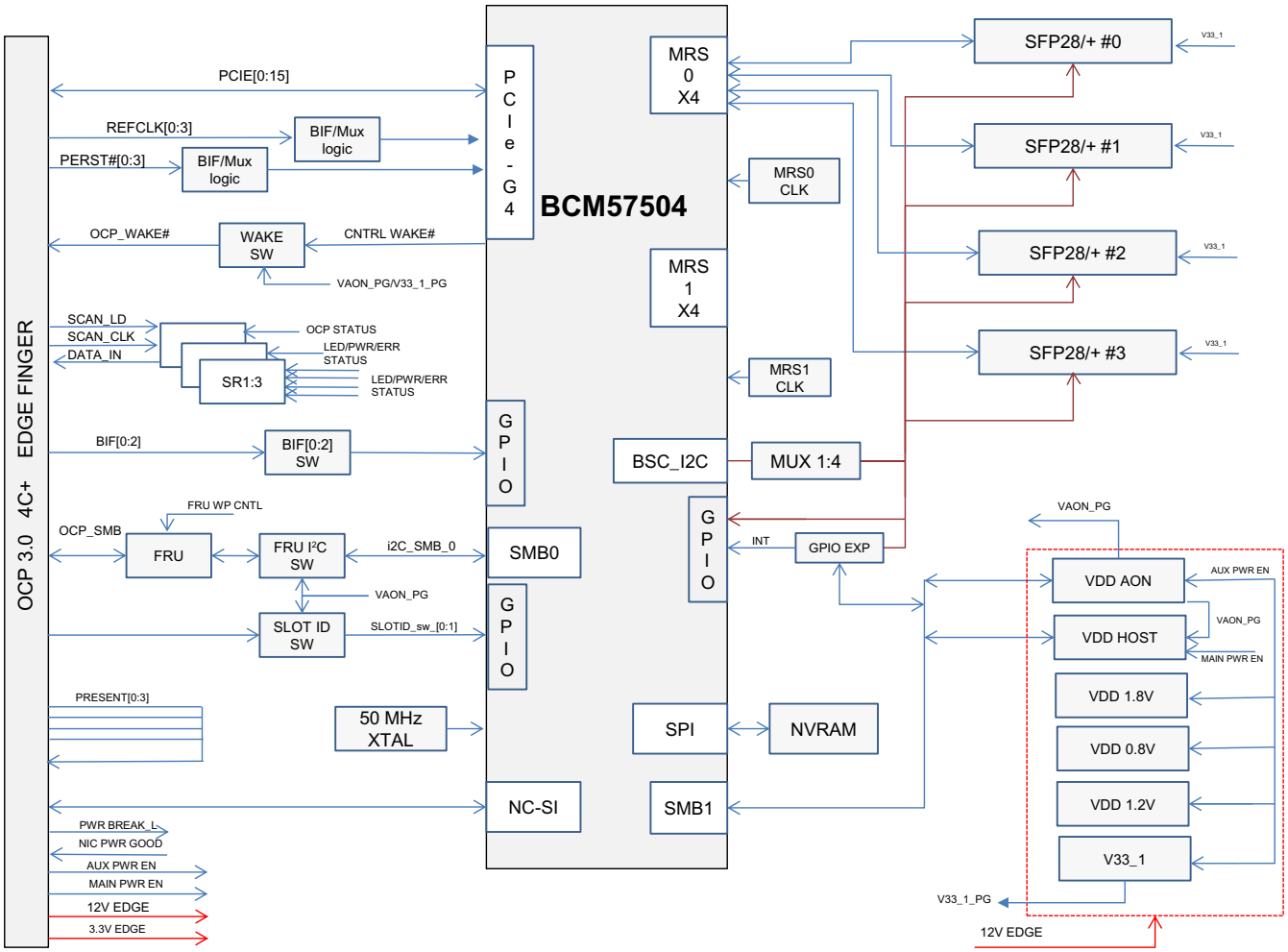
# 1 Functional Description

This section provides the functional description of the BCM957504-N425G network adapter.

## 1.1 Block Diagram

Figure 2 shows the main functional blocks on the BCM957504-N425G network adapter.

**Figure 2: BCM957504-N425G Block Diagram**



## 1.2 BCM57504 Ethernet Controller

The BCM57504 Ethernet controller is configured as a quad-port 25 Gb/s interface to the line side and x16 PCI Express v4.0 interface to the system host.

## 1.3 PCI Express Interface

PCIe is a high-bandwidth serial bus providing a low pin-count interface as an alternative to parallel PCI. It is part of the host interface connector. The BCM57504 complies with the PCI Express Base Specification Revision 4.0, and supports a 16-lane PCIe 4.0 interface via the host interface connector.

## 1.4 NC-SI Interface

The BCM57504 Ethernet controller supports the Network Controller Sideband Interface (NC-SI) Specification version 1.1.0. The NC-SI provides a standardized interface between the system baseboard management controller (BMC) and the integrated NC-SI module of the BCM57504.

## 1.5 SMBus Interface

The BCM57504 Ethernet Controller SMB0 interface supports serial communications between BCM57504 and the system. The interface allows the Ethernet controller to function as a SMBus primary or secondary device.

## 1.6 Non-Volatile RAM

The BCM57504 Ethernet controller requires a non-volatile serial flash memory (NVRAM) to store the device firmware, PCI configuration space settings (for example, device ID, vendor ID), MAC address, and so on. After power-up, the firmware is downloaded into the device memory and executed by the on-chip processor.

## 1.7 Heat Sink

The passive heat sink is attached to the Ethernet controller using four spring-loaded push pins that insert into four mounting holes.

## 1.8 Power Supplies

All power is derived from the network adapter host interface connector 12V and 3.3V supply which feeds the onboard regulators that provide the necessary power to the various components on the network adapter. The network adapter has six switching voltage regulators that power the adapter's VDDC_AON, VDDC_HOST, +0.8V, +1.2V, +1.8V, and +3.3V loads.

## 1.9 LED Functions and Locations

The SFP28 port supports two LEDs to indicate traffic activities and link speed. The LEDs are visible as shown in Figure 3. Its locations and form factors conform to the OCP 3.0 Design Specification.

**Figure 3: Activity and Link LED Locations**

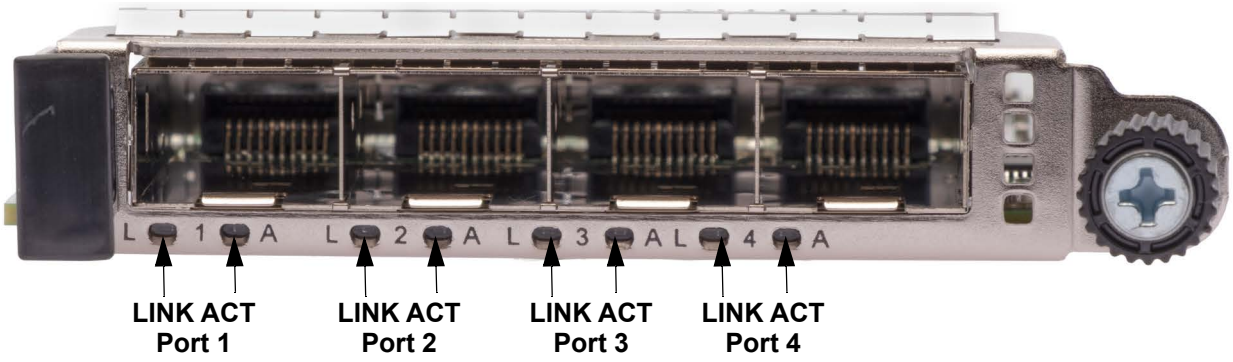



**Table 1: LED Functions**

| LED Type | Color/Behavior | Note |
|---|---|---|
| Activity | Off | No Activity |
| | Green (blinking) | Link up (traffic flowing) |
| Link | Off | No Link |
| | Green | Linked at 25 Gb/s |
| | Amber | Linked at lower speed |

## 1.10 PCIe Plug-N-Play Identification

Table 2 provides the PCIe PNP IDs for the adapter.

**Table 2: PCIe PNP IDs**

| Field | Value |
|---|---|
| Vendor ID | 0x14E4 |
| Device ID | 0x1751 |
| Sub-Vendor ID | 0x14E4 |
| Sub-Device ID | 0x5425 |

# 2 Board Power and Environmental Specifications

Table 3 provides the adapter power consumption.

**Table 3: Adapter Power Consumption**

| Adapter Power[a] | Passive DAC Cable | Optical Transceiver[b] |
|---|---|---|
| Typical – 50% Ethernet traffic | 16.0W | 18.5W |
| Max – 100% Ethernet traffic | 16.9W | 19.5W |

a. Power consumption of adapter at 55°C ambient temperature.

b. Power consumption of adapter is measured using Broadcom AFBR-735SMZ power level 1 optical transceiver. The total adapter power adapter may vary with different optical transceivers.

**Table 4: Adapter Environmental Specifications**

| Airflow | Ambient Temperature | Passive DAC Cable | Optical Transceiver[a] |
|---|---|---|---|
| Cold Aisle | 45°C | Tier 7, 225 LFM | Tier 7, 225 LFM |
| Hot Aisle | 55°C | Tier 6, 275 LFM | Tier 8, 360 LFM |
| Storage Humidity | Relative Humidity Range (Non-condensing) maximum 90% at 35°C | | |
| Storage Temperature | –40°C to 70°C | | |
| Operating Temperature | 0°C to 55°C | | |

a. Airflow requirements are measured using Broadcom AFBR-735SMZ (power level 1, commercial temp [70°C]) optical transceivers. Check the airflow requirements of the selected optical transceivers to ensure adequate cooling to the optical transceivers.

# 3 Package Weight

Table 5 shows the BCM957504-N425G package weight with the pull-tab bracket installed by default (excluding the optical module).

**Table 5: Package Weight**

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| BCM957504-N425G weight | g | 117 | gram |

# 4 Physical Specifications

The physical board dimensions are compliant with the OCP 3.0 design specification, small form factor (SFF) network adapter, and faceplate. See the mechanical dimensions in the OCP 3.0 Design Specification for additional information.

The BCM957504-N425G supports all three faceplates—for example, pull tab, ejector latch, and internal lock. The pull tab is installed by default. For additional mechanical dimensions, see the OCP 3.0 Design Specification.

# 5 Regulatory and Safety Approvals

The BCM957504-N425G network adapter meets the regulatory requirements of the OCP 3.0 Design Specification. For additional information on required compliance including environmental, EMC, product safety, and immunity (ESD), reference the OCP 3.0 Design Specification.

# 6 Ordering Information

**Table 6: Ordering Information**

| Part Number | Description |
|---|---|
| BCM957504-N425G | Quad-Port 25 Gb/s Ethernet PCI Express 4.0 x16 OCP 3.0 Network Adapter, Halogen-Free |

# Revision History

## 957504-N425G-DS106; November 3, 2025

Updated:

- Figure 1, BCM957504-N425G OCP 3.0 SFF Network Adapter – Replaced photo.
- Figure 3, Activity and Link LED Locations – Replaced photo.

## 957504-N425G-DS105; June 30, 2023

Updated:

- Updated virtual functions to 1K in feature list.

## 957504-N425G-DS104; March 8, 2022

Updated:

- SMBus Interface – Updated section.
- Table 2, LED Functions – Changed No Link to No Activity

## 957504-N425G-DS103; August 20, 2021

Updated:

- Board Power and Environmental Specifications – Updated the entire section.

## 957504-N425G-DS102; January 2, 2020

**Updated:**

- Features – Updated the OCP Design Specification Version to 1.00.
- Airflow Requirements – Updated airflow requirements.

## 957504-N425G-DS101; September 19, 2019

Updated:

- Board Power Consumption – updated consumption table.
- Package Weight – updated package weight.

## BCM957504-N425G-DS100; March 27, 2019

Initial release.

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