

## Product Brief

# BCM57608

## Quad-Port 400Gb/s Ethernet Controller with PCIe 5.0 and 100G PAM-4 SerDes

### Description

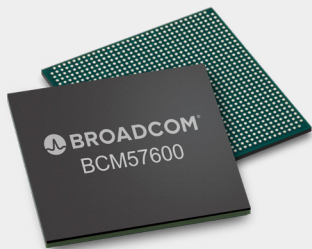
Building upon the success of the widely deployed Broadcom® NIC architecture, the BCM57608 series Ethernet controllers continue to drive innovation by supporting 400Gb/s aggregate throughput while maintaining the industry's lowest power and best thermal solution. The BCM57608 series supports network interfaces of 400/200/100/50/25/10GbE.

Incorporating industry-leading PHY technology, the BCM57608 provides highly efficient network connectivity using eight lanes of built-in SerDes, each supporting 100/50G PAM-4 and 25G NRZ. When paired with the Broadcom market-leading StrataXGS® or StrataDNX™ Ethernet switches, the BCM57608 ensures the highest level of performance, interoperability, and features. This includes the longest reach for passive direct attached cables (DAC) of up to 5 meters, to accommodate most in-rack and rack-to-rack deployments.

The BCM57608 supports the fourth generation, standards-based RDMA over converged Ethernet (RoCEv2) with hardware-based congestion control as well as support for Linear Pluggable Optics (LPO). Broadcom RoCE congestion control not only delivers the lowest latency in real-life scenarios, but also dramatically reduces the complexity of RoCE deployment at scale.

The BCM57608 fourth-generation 400G TruFlow™ engine integrates hardware acceleration with enhanced programmability for the parser/lookup/match/action engine to allow for rapid implementation of new flow types. TruFlow increases virtual machine density and improves application performance.

The BCM57608 supports technology-leading security, enabling the industry's most secure server platform with Broadcom secure boot and attestation anchored in silicon root of trust.



### Highlights

- Single, dual, or quad-port with 400Gb/s aggregate throughput
- 400/200/100/50/25/10GbE
- 8x SerDes: 100/50G PAM-4 or 25G NRZ
- PCIe 5.0 x16, multihost up to four hosts
- Up to 5 meter DAC cable support
- RoCEv2
- 400G TLS/QUIC inline encryption
- Precision timing support: PTP, SyncE
- Transmit pacing
- Secure boot and attestation
- TruFlow 400G flow offload
- PCIe embedded analyzer (PEA)

## Applications

- AI scale-out networking
- AI server front-end
- Cloud and enterprise servers
- 5G wireless RAN
- Network function virtualization
- Mobile edge computing
- High performance computing (HPC)
- Content Delivery Networks (CDN)
- Storage servers

## Benefits

The BCM57608 leverages industry-leading technology to deliver best-in-class results:

- Lowers data center total cost of ownership (TCO) with the industry's lowest-power, 400G-capable NIC
- Unleashes the networking performance of PCIe 5.0-capable servers
- Best-in-class 100G SerDes deliver superior network reliability over passive and active cables, while reducing network power consumption
- Enables large-scale RoCE deployment with high-precision hardware and user-programmable congestion control
- Inline encryption support to offload CPU and improve system and application performance
- Class-D precision timing with 5ns timestamp accuracy
- Improves network reliability and real-time control with in-band telemetry
- Accelerates applications with kernel-bypass: RDMA, DPDK, and SR-IOV
- Improves CPU efficiency for I/O with comprehensive stateless offloads
- Enhances system and network management

## Key Features

### Network Interface:

- 8 SerDes capable of 100/50G PAM4 and 25G NRZ
- Support for up to four ports
- 1x 25/50/100/200/400GbE
- 2x 25/50/100/200GbE
- 4x 25/50/100GbE
- 400Gb/s total bandwidth
- Auto-negotiation with auto-detect
- IEEE-1588v2

### Host Interface:

- 16 lanes of PCI Express 5.0
- Link rates: 32, 16, 8, 5, 2.5 GT/s
- Lane configuration: x16, x8, and x4
- PCIe bifurcation
- Multi-host / multi-root up to four
- MSI-X support

### Security:

- Data security:
  - kTLS hardware offload encryption/decryption support
  - QUIC hardware offload encryption/decryption support
- Platform security:
  - Hardware secure boot (RoT)
  - Attestation (SPDM 1.2)

### Networking and Virtualization:

- RoCEv2
- Multi-Queue, NetQueue, and VMQ
- Single root I/O virtualization
- VF isolation and protection
- VXLAN, GRE, NVGRE, Geneve, and IP-in-IP
- Tunnel-aware stateless offloads
- Edge virtual bridging (EVB)
- Stateless TCP offloads: IP/TCP/UDP checksum, LSO, LRO, GRO, TSS, RSS, aRFS, interrupt coalescing

## Key Features (cont.)

### TruFlow Flow Processing:

- Flexible matching key
- NAT and NAPT
- Tunnel encap/decap
- Custom tunnel processing
- Connection tracking
- Flow aging
- Sampling and mirroring
- Rate-limiting and metering
- Flow-based statistics
- Network traffic hairpin

### RoCEv2:

- Standards-based
- DCQCN
- Peer memory direct
- Automated configuration

### Timing and Synchronization:

- IEEE 1588v2
- Class C/D timing
- 5-ns time-stamping accuracy
- SyncE
- PTM
- Transmit pacing and SO\_TXTIME
- O-RAN LLS-C1/2/3

### Manageability:

- Network controller sideband interface (NC-SI)
- Management Component Transport Protocol (MCTP)
- MCTP over SMBus/I2C
- MCTP over PCIe VDM
- NC-SI over MCTP
- Platform Level Data Model (PLDM): base, monitoring/control, and firmware update
- PLDM over MCTP
- I2C support for device control and configuration

### Network Boot:

- PXE boot
- iSCSI boot
- UEFI support for x86 and Arm servers

## Ordering Information

Part Number	Throughput	Host Interface	Network Interface	Package
BCM57608B1KFSBG	400 Gb/s	×16 PCIe 5.0	1 × 400GbE, 2 × 200GbE, or 4 × 100GbE	23 mm x 23 mm FCGBA