

# BCM5720-2P

## Dual-Port Ethernet Server Adapter

### General Description

The Broadcom<sup>®</sup> NetXtreme<sup>®</sup> BCM5720-2P is a dual-port 10/100/1000 Mb/s x1 PCI Express (PCIe) Ethernet adapter that supports the IEEE 802.3ab standard over Category 5 twisted-pair cable. The adapter card supports offload technologies including Large Send, TCP segmentation, and TCP/UDP/IP checksum, and receive-side scaling (RSS) that deliver optimal network throughput, lower host processor utilization and as a result improve system overall performance. The adapter card comes in small form factor that is suitable for both low-profile and standard chassis.

### Features

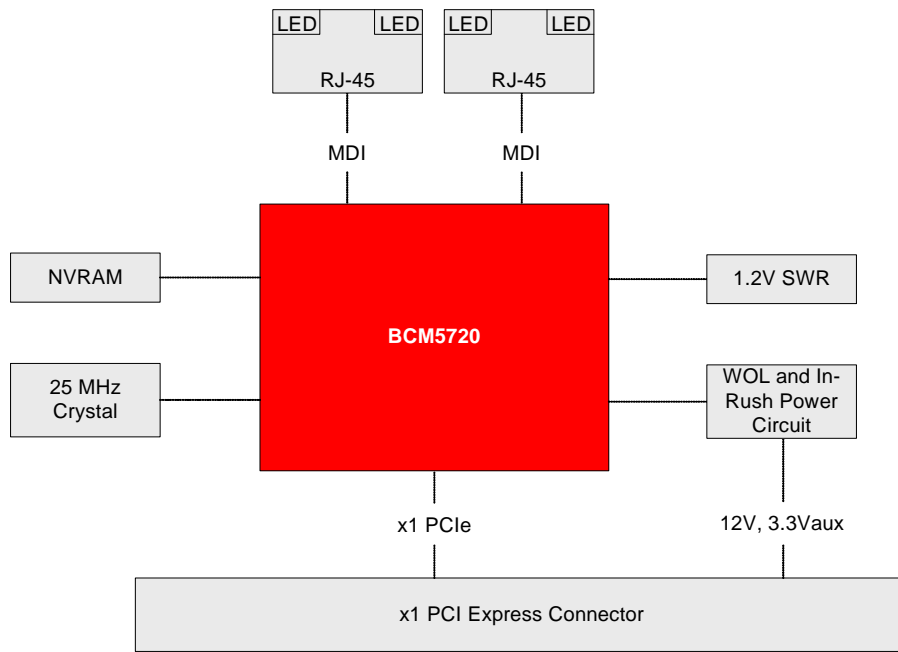
- Dual-port Gigabit Ethernet (GbE) Adapter
- IEEE 802.3ab 10/100/1000 Mb/s Gigabit Ethernet-compliant
- Virtual LANs (VLANs): IEEE 802.1q VLAN tagging
- x1 PCI Express v1.x and v2.x
- Energy Efficient Ethernet-compliant with IEEE Standard 802.3az-2010
- MSI and MSI-X capabilities—up to 17 MSI-X vectors
- I/O virtualization support for VMWare, NetQueue, and Microsoft VMQ
  - 17 receive queues and 16 transmit queues per port
  - 17 MSI-X vectors supporting per queue interrupt to host
- Function Level Reset (FLR)
- ECC error detection and correction on internal SRAM
- TCP, IP, and UDP checksum offload
- Large Send offload, TCP segmentation offload
- Receive-side scaling
- Jumbo frames (9 KB)
- IEEE 802.3x flow control
- Statistics for SNMP MIB II and Ethernet-like MIB
- Comprehensive diagnostic and configuration software suite
- ACPI 1.1a-compliant: multiple power modes
- Wake-on-LAN (WOL)

- Dual RJ-45 with integrated link and activity LEDs
- Low-profile form factor: 2.7 in. x 4.4 in.
- RoHS-compliant (lead-free)

### Applications

The BCM5720-2P is compatible with x86 and x64 servers utilizing the PCIe v1.X and v2.X interfaces.

Figure 1: Functional Block Diagram



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# Chapter 1: Introduction

## 1.1 Overview

The Broadcom® BCM5720-2P is a dual-port 10/100/1000 Mb/s x1 PCI Express Specification v2.1 Ethernet server adapter that supports the IEEE 802.3ab standard over Category 5 twisted-pair cable. The adapter card supports offload technologies and receive-side scaling. Offload technologies (including Large Send, TCP segmentation, and TCP/UDP/IP checksum) and RSS deliver optimal network throughput and lower host processor utilization, resulting in improved overall system performance. The server adapter comes in a small form factor that is suitable for both low-profile and standard chassis configurations.

## 1.2 Features

The BCM5720-2P NIC supports the following features:

- Dual-port Gigabit Ethernet Server adapter
- IEEE 802.3ab 10/100/1000 Mb/s Gigabit Ethernet-compliant
- Virtual LANs (VLANs): IEEE 802.1q VLAN tagging
- x1 PCI Express v2.1
- Energy Efficient Ethernet compliant with IEEE Standard 802.3az-2010
- MSI and MSI-X capabilities—up to 17 MSI-X vectors
- I/O virtualization support for VMWare, NetQueue, and Microsoft VMQ
  - 17 receive queues and 16 transmit queues per port
  - 17 MSI-X vectors supporting per queue interrupt to host
- Function Level Reset (FLR)
- ECC error detection and correction on internal SRAM
- TCP, IP, and UDP checksum offload
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- Receive-side scaling
- Jumbo frames (9 KB)
- IEEE 802.3x flow control
- Statistics for SNMP MIB II and Ethernet-like MIB
- Comprehensive diagnostic and configuration software suite
- ACPI 1.1a-compliant: multiple power modes
- Wake-on-LAN (WOL)
- Dual RJ-45 with integrated link and activity LEDs
- Low-profile form factor: 2.7" x 4.4"
- RoHS-compliant (lead-free)

Figure 2: BCM5720-2P Ethernet Server Adapter



## Chapter 2: Functional Overview

### 2.1 Functional Block Diagram

The functional block diagram in [Figure 1](#) shows the high-level components used in the BCM5720-2P. Each component is described in detail in the sections that follow.

### 2.2 PCI Express Host Interface

The BCM5720-2P Ethernet server adapter complies with the *PCI Express Base Specification* (Revisions 2.1) and supports 5.0 GT/s and 2.5 GT/s signaling capability.

The card-edge connector follows the x1 PCI Express standard pinout for add-in cards outlined in Table 5-1, Section 5.1 of *PCI Express Card Electromechanical Specification* (Revisions 2.0).

**NOTE:** For full network performance on both Ethernet ports, use 5.0 GT/s signaling.

### 2.3 Ethernet Server Adapter

The BCM5720-2P Ethernet server adapter is a dual-port Gigabit MAC with integrated PHY whose Gigabit Media Dependent Interface (MDI) differential signals are connected to the RJ-45 connectors. The BCM5720-2P controls the WOL power switching circuitry as well.

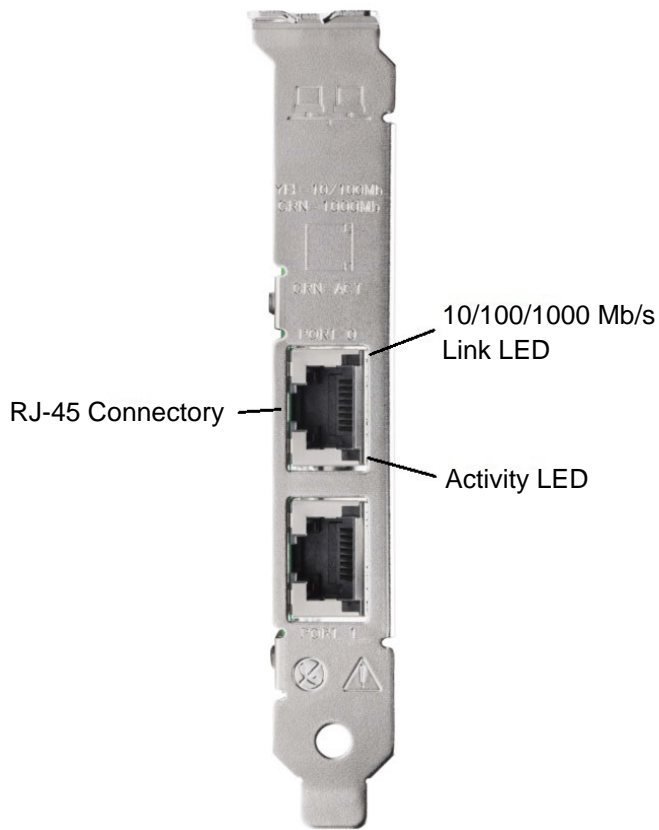
### 2.4 RJ-45 Connectors and LED Functions

The BCM5720-2P supports two RJ-45 connectors. There are two LEDs integrated on each RJ-45 connector. The LEDs are described as follows:

- The Link LED is located at the upper right corner of the connector.
  - Yellow = 10 Mb/s
  - Yellow = 100 Mb/s
  - Green = 1000 Mb/s
- The Activity LED is located at the lower right corner of the connector.
  - Green = Blinks when there is activity on the wires

Figure 3 shows the locations of the LEDs and the RJ-45 connectors.

Figure 3: LEDs and RJ-45 Connectors



## 2.5 Non-Volatile RAM

The BCM5720-2P uses an external nonvolatile serial flash memory (NVRAM) to store boot code and PCI configuration information such as Device ID and Vendor ID, as well as various firmware components. The boot code is downloaded to the device memory and is executed by an internal processor. User mode software running on the host system can be used to upgrade the boot code contents in the NVRAM.

## 2.6 Regulatory and Safety

The following sections detail the Regulatory, Safety, Electromagnetic Compatibility (EMC), and Electrostatic Discharge (ESD) standard compliance for the BCM5720-2P Network Interface Card.

### 2.6.1 Regulatory

Table 1: Regulatory Approvals

Item	Applicable Standard	Approval (A)/Certificate (C)
CE/European Union	EN 62368-1:2014	CB report and certificate
UL/USA	IEC 62368-1 (ed. 2)	CB report and certificate

### 2.6.2 Safety

Table 2: Safety Approvals

Country	Certification Type/Standard	Compliance
International	CB Scheme ICES 003 – Digital Device UL 1977 (connector safety) UL 796 (PCB wiring safety) UL 94 (flammability of parts)	Yes

### 2.6.3 Electromagnetic Compatibility (EMC)

Table 3: Electromagnetic Compatibility

Standard/Country	Certification Type	Compliance
CE/EU	EN 55032:2012/AC:2013 Class B EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013	CE report and CE DoC
FCC/USA	CFR47 Part 15 Subpart B Class B	FCC/IC DoC and EMC report referencing FCC and IC standards
IC/Canada	ICES-003 Class B	FCC/IC DoC and report referencing FCC and IC standards
ACA/Australia, New Zealand	AS/NZS CISPR 22:2009 +A1 :2010	ACA certificate
BSM/Taiwan	CNS 13438 (2006) Class B	BSMI certificate
BSMI/Taiwan	CNS 15663	BSMI certificate/RoHS table
MSIP/S. Korea	RRL KN22 Class B KN24	Korea certificate MSIP mark
VCCI/Japan	VCCI V-3 (2015-04)	Copy of VCCI online certificate



## 2.6.4 Electrostatic Discharge (ESD) Compliance

Table 4: ESD Compliance Summary

Standard	Certification Type	Compliance
EN 55024:2010 (EN 61000-4-2)	Air/Direct discharge	Yes

## 2.6.5 FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help.

**NOTE:** Changes or modifications not expressly approved by the manufacture responsible for compliance could void the user's authority to operate the equipment.

## 2.7 DC Power Specification

Table 5 shows the total power consumption required from the 12V and 3.3Vaux PCIe card-edge connector pins.

Table 5: Board Power Consumption

Condition	3.3Vaux (A)	12V (A)	Total Power (W)
No Link (idle)	0	0.082	1.00
10BASE-T	0	0.108	1.31
100BASE-T	0	0.111	1.35
1000BASE-T	0	0.183	2.23
Low Power Mode (10BASE-T)	0.138	0	0.50
Low Power Mode (100BASE-T)	0.161	0	0.58

## 2.8 Environmental Specifications

Table 6: Environmental Specifications

Parameter	Condition
Operating Temperature	0°C–55°C
Air Flow Requirement (LFM)	0
Storage Temperature	–40°C– +65°C
Storage Humidity	5% to 95% non-condensing
Vibration and Shock	IEC 68, FCC Part 68.302, NSTA, 1A

**Table 6: Environmental Specifications**

Parameter	Condition
Electrostatic/Electromagnetic Susceptibility	EN 61000-4-2, EN 55024

## Chapter 3: Ordering Information

**Table 7: Ordering Information**

Part Number	Description
BCM5720-2P	Dual-Port Single Ethernet Server Adapter
BCM5720-2PBLK	Dual-Port Single box with Ten Ethernet Server Adapters

## Revision History

### **5720-2P-DS102; January 4, 2018**

**Updated:**

- [Regulatory and Safety](#)

### **5720-2P-DS101-R; March 13, 2015**

**Updated:**

- Ordering information

### **57202P-DS100-R; February 9, 2015**

Initial release.

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