QXG-25G2SF-E810
25GbE Network Expansion Card
Upgrade to enterprise-level networks with 25GbE

Compatible with NAS and PC
SSD prices are dropping and becoming the mainstream choice in the market

As HDD shipments continue to decline, SSDs are becoming the mainstream storage choice.

According to Storage Newsletter, HDD shipments in the second quarter of 2022 totaled 45 million units, a significant drop from the 2010 peak of 651 million units. Compared to the same period in 2021, shipments are down 26.9% to 29.7%. Shipments of 3.5-inch HDDs (including external HDDs) in the consumer market fell by more than 30%, and even worse than the 3.5-inch HDD consumer market, shipments of 2.5-inch HDDs fell by about 40%. In addition to the weak overall demand for HDDs, the decline in HDD shipments was also due to a large proportion of the impact of the development of solid state drives (SSDs). According to the statistics, the price of NAND Flash TLC and QLC chips have dropped by 8%~13% in Q2 2022 and will drop by another 5%~10% in Q3 2022, making SSDs affordable for both consumers and enterprises, and leading more users to look at next-generation storage options. Looking ahead, the market has moved significantly toward SSDs as a storage option.

Quoted from: Internet News

<table>
<thead>
<tr>
<th>Vendor</th>
<th>HDDs in million</th>
<th>Q/Q change</th>
<th>Y/Y change</th>
<th>Market share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seagate</td>
<td>19.80 – 20.60</td>
<td>-13.8% – -10.4%</td>
<td>-29.7% – -26.9%</td>
<td>44.7% - 44.3%</td>
</tr>
<tr>
<td>Toshiba</td>
<td>8.00 – 8.60</td>
<td>-20.2% – -14.3%</td>
<td>-42.8% – -38.5%</td>
<td>18.1% – 18.5%</td>
</tr>
<tr>
<td>WDC</td>
<td>16.50 – 17.30</td>
<td>-16.5% – -12.4%</td>
<td>-34.6% – -31.4%</td>
<td>37.2% – 37.2%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>44.30-46.50</td>
<td>-15.0% – -11.9%</td>
<td>-34.2% – -31.0%</td>
<td></td>
</tr>
</tbody>
</table>

*Preliminary data – values may change.

Image Source : Storage Newsletter

Reference News
Overstocked Supply Chain to Drive NAND Flash Price Declines of 8-13% in 3Q22 - EE Times Asia (eetasia.com)
HDD Shipments Plummet 33% YoY on Weakening Demand | Tom's Hardware (tomshardware.com)
10GbE is no longer able to fully utilize SSD high-speed storage performance.

10GbE transmission rate

10GbE Network Transmission Causes Bottlenecks

Limited IOPS or Below 2,000 MB/s

PC/Workstation

QNAP Enterprise NAS

Different disk drive combinations
• 24 x SATA HDD + 6 x SATA SSD (Best capacity)
• or 30 x SATA SSD (Best performance)
Agenda

- Product Specification
- QXG-25G2SF-E810 Performance Test
- Build 25GbE Network Environment
Product Specification
New 25GbE High Speed Network Interface Card
QXG-25G2SF-E810

QXG-25G2SF-E810
Dual-Port 25GbE SFP28 Half-High NIC
- 2 x SFP28 ports
- Support 25GbE / 10 GbE dual Speed
- Support PCIe Gen 4, and compatible with PCIe Gen 3

Optional accessory available:
25GbE SFP28 DAC Cable

Intel® E810-XXVAM2 Network Chip
QXG-25G2SF-E810 with various brackets for installation in any kind of NAS and PC/server chassis

Bracket for certain QNAP NAS models

Pre-installed half-height low profile bracket

Full-height bracket is included
Performance-oriented QXG-25G2SF-E810
25GbE Network Interface Card

Heatsink cooling module: Maximum contact area with the cooling fan, achieving the optimal heat dissipation.

Fan: Outperforms competing 25GbE NIC with heat-reducing fan to keep the platform cool and maintains high performance.

PCI Express 4.0 x8 bus (backward support for PCI Express 3.0)
The interface provides up to 128Gbit/s bandwidth
PCIe Gen4 has **twice** the bandwidth of PCIe Gen3, up to 16 GT/s, and only requires Gen4 x 4 to utilize the full potential of the QXG-25G2SF-E810 dual-port 25GbE x 2 for a total of 50GbE.

Major PCIe interfaces are gradually moving from Gen3 to Gen4, and although Gen4 is backward compatible with Gen3, it is especially important to equip a complete set of devices with Gen4 interfaces to fully utilize the high bandwidth of Gen4 as the amount of data being transferred is increasing by leaps and bounds.

More flexibility, more bandwidth, the best answer for data-intensive work.
QXG-25G2SF-E810 supports iSCSI, which simplifies storage management while realizing high-speed access to enhance operational efficiency, and through the network, it realizes remote storage to achieve unlimited storage access, and in the virtualization environment, it can achieve seamless integration of virtual machines and storage devices, giving you an efficient and flexible storage solution.
Flexible VLAN Support

QXG-25G2SF-E810 supports VLAN to help you create virtual network zones to separate your network into different areas for more secure and organized connections. It allows you to meet your different needs in a more organized and efficient way in complex network environments in different usage contexts.
QXG-25G2SF-E810 supports On-chip QoS for dynamic resource allocation, priority scheduling, bandwidth control, traffic management and dynamic workload adjustment. On-chip QoS allows you to improve system performance and efficiency in a variety of application scenarios, ensure mission-critical execution and optimize resource allocation to meet the needs of different applications.
QXG-25G2SF-E810 supports Forward Error Correction (FEC), which is designed to minimize the Bit Error Rate (BER) and ensure data accuracy by allowing the receiver to quickly recover from packet errors caused by signal degradation that can occur at high network speeds and over long distances. There are three FEC modes in total, allowing you to flexibly plan your network environment with suitable cables and switches.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Latency</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO FEC</td>
<td>Lowest</td>
<td>Shortest</td>
</tr>
<tr>
<td>BASE-R FEC (Firecode)</td>
<td>~ 80ns</td>
<td>Middle</td>
</tr>
<tr>
<td>RS-FEC (Reed Solomon)</td>
<td>~ 260ns</td>
<td>Longest</td>
</tr>
</tbody>
</table>

Notes:
- In QTS 4.5.3 / QuTS hero 4.5.2 or later, you can set the FEC mode according to your network environment in the network card setup page.
- Windows / Linux requires a separate driver.
- The transmitter must be set in the same mode as the receiver.
- If the QXG-25G2SF-E810 does not connect to the switch, please check whether the latest version of the switch's firmware supports FEC, and if the switch does not support FEC, please disable the FEC function of the NIC through the NAS or computer operating system.
Since QTS 5.1.0 / QuTS hero h5.1.0, QNAP NAS fully supports SMB multichannel. The network fault tolerance makes the system operation more stable. Even if one network connection fails, the NAS still maintains the file transmission with the remaining number of connections to minimize the risk of interruption; when the network recovers, the total transmission bandwidth is immediately restored. With SMB Multi-Channel enabled, the system automatically explores all network ports on the NAS and automatically aggregates them, resulting in a large bandwidth stack that is ideal for 8K/16K multimedia and large file transfers.

Multiply Bandwidth, Maximize Performance: Experience a Performance Leap with SMB Multichannel

Combined bandwidth provides up to 50GbE data transfer potential through SMB Multichannel.

Network fault tolerance setting (failover backup). Ensuring the continuity of network service.

SMB Multichannel System Requirements and Notes:
- NAS and Client devices support SMB 3.0, QTS 5.1.0 or above, QuTS hero h5.1.0 or above, Windows 8.1 or above, Windows Server 2012 or above, macOS Big Sur 11.3.1 or above.
- SMB Multi-Channel can only combine network ports of the same speed on a single device, e.g., 25GbE + 25GbE.
- The same number of network ports must be used between the two devices.
- If the two devices use different speed network ports, the performance of the two devices depends on the slower speed, e.g., if the NAS uses two ports of 10Gbe and the PC device uses two ports of 2.5GbE, the SMB multichannel transmission speed between the two devices is only 5 Gbps.
- Actual SMB multichannel transfer performance varies depending on the hardware configuration (e.g., CPU, memory, hard disk, switch, etc.) and performance of the NAS and client devices.
- RSS, RDMA, and NIC Teaming are not supported in the latest version of SMB Multichannel.
Flexible Development of 25GbE in NAS, PC, Servers

- Windows Server 2022
  - Windows 10/11
- Ubuntu 20.04 LTS
- QTS
  - QTS 5.0.1
  - or a later updated version
- QuTS hero
  - QuTS hero 5.0.1
  - or a later updated version
Step 1: Go to Intel's official website. Click Search Intel.com in the upper right corner and type in E810-XXVAM2.
Step 2: Click on "Drivers & Software" on the left when you see the search results.
Step 3: In the search results that appear in the middle of the screen, you can find the drivers you need for Windows, Windows Server, or Ubuntu.
## Administrative Tools for Intel® Network Adapters

<table>
<thead>
<tr>
<th>ID</th>
<th>Date</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>2993</td>
<td>8/7/2023</td>
<td>28.2 (Latest)</td>
</tr>
</tbody>
</table>

### Introduction

This download record installs version 28.2 of the administrative tools for Intel® Network Adapters.

### Available Downloads

| OS Independent, Microsoft Windows® | Size: 6.4 MB | SHA1: 9C4F547232626AA5F0043C39A33C688B300013 |
| Download PROADMIN.zip              |              |                                              |

| OS Independent, Linux®            | Size: 5 MB   | SHA1: CE2F004D5A49FB7D4CA05F0A0A2736EA493273CA |
| Download PROADMIN.gz               |              |                                              |

### Documentation

- Release Notes (Release_Notes_28.2.pdf)
- README Text Files (readme_28.2.txt)

Download and install Windows driver package.
Windows Server 2022 Driver Download

**Step 1:** Install the driver package firstly.

**Step 2:** install the Intel® PROSet package secondly.
Ubuntu Driver Download

Available Downloads

- Download `intel-public-key-xicc.zip`
  - Linux
  - Size: 1 KB
  - SHA1: BF2DEB72DDAF96C12FC1D24017364FF7609EE56

- Download `RHEL_8.8_xicc_1.12.6_RPM.zip`
  - Linux
  - Size: 1.8 MB
  - SHA1: 062B602E0AFA4CA067CD5446A7F60DAFA355E8

- Download `RHEL_8.1_xicc_1.12.6_RPM.zip`
  - Linux
  - Size: 1.8 MB
  - SHA1: D1F1C5CA029E01868FF78395A714B2790A62AD4

- Download `ko-1.12.6-i686.zip`
  - Linux
  - Size: 1.2 MB
  - SHA1: 814C88B8AF2CD61D86A6FAFDFD15432FCC21687851

- Download `RHEL_8.7_xicc_1.12.6_RPM.zip`
  - Linux
  - Size: 1.8 MB
  - SHA1: 5238EDF820A005FF82B876A08B89548FAE62

- Download `RHEL_9.2_xicc_1.12.6_RPM.zip`
  - Linux
  - Size: 1.8 MB
  - SHA1: D13D9700B8F177BC069300105BF3D9C1FC86C

- Download `SLCC_13.4_xicc_1.12.6_RPM.zip`
  - Linux
  - Size: 3 MB

Click to download the driver package.
QXG-25G2SF-E810 is backed by a 3-year product warranty.

QXG-25G2SF-E810 comes with a free 3-year product warranty.

More information: QNAP Warranty Service

QNAP-Warranty Service Official Website
https://www.qnap.com/service/product-warranty/go/
Step 1: Go to **Compatibility List - QNAP** and select search by devices.

QNAP-Compatibility List Official Website [https://www.qnap.com/go/compatibility/](https://www.qnap.com/go/compatibility/)

Step 2: In 1 - Category, select the type of device you want to query. **Expansion Card** will be used as a sample category for the following demonstration.
QXG-25G2SF-E810 Product Compatibility Check

**Step 3:** In 2 – brand, Choose the brand you want to inquire about. We will use QNAP as a sample brand for the following demonstration.

**Step 4:** Below the recommended models you can see all the expansion cards available from QNAP.
QXG-25G2SF-E810 Product Compatibility Check

**Step 5:** Click on any of the recommended models. Take QXG-25G2SF-E810 as a sample case, you can see the brand, model, specification, and compatible QNAP products.
QXG-25G2SF-E810 Performance Test
File Write and File Read
High-speed experience from QXG-25G2SF-E810 with Sequential Throughput

Test Environment
- NAS: TVS-h874T
- CPU: 12th Gen Intel(R) Core(TM) i7-12700, 2480 MHz (10C, 20T)
- Volume type: Raid 5, Samsung 870 EVO 1TB x8
- Client PC: Windows Server 2019, AMD EPYC 7232P 3.0Ghz (1290FX), 64GB RAM
- Iometer: RAM*4, 30-sec ramp up time, 3-min seq run time, 16 worker, 4-outstanding

1 x 25GbE SMB Sequential Transmission (1MB)

<table>
<thead>
<tr>
<th>Write</th>
<th>Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,954 MB/s</td>
<td>2,954 MB/s</td>
</tr>
</tbody>
</table>

2 x 25GbE SMB Sequential Transmission (1MB)

<table>
<thead>
<tr>
<th>Write</th>
<th>Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,908 MB/s</td>
<td>4,173 MB/s</td>
</tr>
</tbody>
</table>
High-speed experience from QXG-25G2SF-E810 with Windows File Explorer

Test Environment
- NAS: TVS-h874T
- CPU: 12th Gen Intel(R) Core(TM) i7-12700, 2480 MHz (10C, 20T)
- Volume type: Raid 5, Samsung 870 EVO 1TB x8
- Client PC: Windows Server 2019, AMD EPYC 7232P 3.0Ghz (1290FX), 64GB RAM
Build 25GbE Network Environment
Highly efficient 25GbE network environment with QNAP NAS and 25GbE network switches

An affordable combination for a smooth, secure and scalable high-speed network environment.
Multiple Scalable 25GbE Network QNAP NAS
- Wide range of enterprise and high-end SMB NAS options

More QNAP NAS models with QXG-25G2SF-E810 support are available!
Coming Soon: QNAP 100GbE Network Switch (QSW-M7308R) with 4-Port 100GbE and 8-Port 25GbE

High-speed 100GbE managed switch

**QSW-M7308R-4X**

- 4x 100GbE QSFP28 network ports (100G/10G/1G)
- 8x 25GbE SFP28 network ports (25G/5G/2.5G/1G/100M)
- Total bandwidth up to 1200Gbps
- Record up to 32000 different MAC addresses and their corresponding interface information
- Equipped with L2 network management function
- Supports Forward Error Correction for seamless connection with QXG-25G2SF-E810
- Compliant with IEEE802.3az Energy Efficient Ethernet standard

Available in October, 2023
QNAP offers a complete line of 10GbE/25GbE accessories

- **25GbE SFP28 DAC**
  - CAB-DAC15M-SFP28
  - CAB-DAC30M-SFP28

- **25GbE SR Transceiver**
  - TRX-25GSFP28-SR

- **10GbE SFP+ DAC**
  - CAB-DAC15M-SFPP
  - CAB-DAC30M-SFPP
  - CAB-DAC50M-SFPP

- **10GbE SR Transceiver**
  - TRX-10GITSFPP-SR

**QXG-25G2SF-E810**
QXG-25G2SF-E810

QNAP is your best choice