QM8790
Mellanox Quantum™ HDR Edge Switch

40-port Non-blocking Externally Managed HDR 200Gb/s InfiniBand Smart Switch

Mellanox provides the world’s smartest switch, enabling in-network computing through the Co-Design Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)™ technology. QM8790 has the highest fabric performance available in the market with up to 16Tb/s of non-blocking bandwidth with sub-130ns port-to-port latency.

SCALING-OUT DATA CENTERS WITH HDR 200G INFINIBAND
Faster servers, combined with high-performance storage and applications that use increasingly complex computations are causing data bandwidth requirements to spiral upward. As servers are deployed with next generation processors, High-Performance Computing (HPC) environments and Enterprise Data Centers (EDC) will need every last bit of bandwidth delivered with Mellanox’s next generation of HDR InfiniBand, high-speed, smart switches.

WORLD’S SMARTEST SWITCH
Built with the Mellanox Quantum InfiniBand switch device, the QM8790 provides up to forty 200Gb/s ports, with full bi-directional bandwidth per port. These stand-alone switches are an ideal choice for top-of-rack leaf connectivity or for building small to extremely large sized clusters.

QM8790 is the world’s smartest network switch, designed to enable in-network computing through the Co-Design Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)™ technology. The Co-Design architecture enables the usage of all active data center devices to accelerate the communications frameworks using embedded hardware, resulting in an order of magnitude application performance improvements.

QM8790 enables efficient computing with features such as static routing, adaptive routing, congestion control and enhanced VL mapping to enable modern topologies (SlimFly, Dragonfly+, 6DT). These ensure the maximum effective fabric bandwidth by eliminating congestion hot spots.

The QM8790 switch has best-in-class design to support low power consumption. Power is further reduced upon partial port utilization.

COLLECTIVE COMMUNICATION ACCELERATION
Collective communication describes communication patterns in which all members of a group of communication endpoints participate. Collective communications are commonly used in HPC protocols such as MPI and SHMEM.

HIGHLIGHTS

† For illustration only. Actual products may vary.
The Mellanox Quantum switch improves the performance of selected collective operations by processing the data as it traverses the network, eliminating the need to send data multiple times between endpoints. It also supports the aggregation of large data vectors at wire speed to enable MPI large vector reduction operations, which are crucial for machine learning applications.

**HDR100**

QM8790 together with the Mellanox ConnectX®-6 adapter card support HDR100. By utilizing two pairs of two lanes per port, the QM8790 can support up to 80 ports of 100G to create the densest TOR switch available in the market. This is a perfect solution for double dense racks with more than 40 servers per rack and also helps small-medium deployments with the need to scale to 3-level fat-tree, to lower power, latency and space.

**BUILDING EFFICIENT CLUSTERS**

QM8790 is the industry’s most cost-effective building block for deploying high performance clusters and data centers. Whether looking at price-to-performance or energy-to-performance, QM8790 offers superior performance, low power and scale, reducing capital and operating expenses, and providing the best return-on-investment.

### FEATURES

- **Mellanox QM8790**
  - 19” rack mountable 1U chassis
  - 40 QSFP56 non-blocking ports with aggregate data throughput up to 16Tb/s (HDR)

- **Switch Specifications**
  - Compliant with IBTA 1.21 and 1.3
  - 9 virtual lanes: 8 data + 1 management
  - 256 to 4Kbyte MTU

- **Connectors and Cabling**
  - QSFP56 connectors
  - Passive copper or active fiber cables
  - Optical modules

- **Indicators**
  - Per port status LED Link, Activity
  - System LEDs: System, fans, power supplies
  - Unit ID LED

- **Power Consumption**
  - Contact Mellanox Sales

- **Adaptive Routing**
- **Congestion control**
- **Port Mirroring**
- **4X49K entry linear forwarding database**

- **Management Ports**
  - PC (RJ45)
  - System reset button

- **Controls and Cabling**
  - Passive copper or active fiber cables
  - Optical modules

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### COMPLIANCE

<table>
<thead>
<tr>
<th>Safety</th>
<th>EMC (Emissions)</th>
<th>Operating Conditions</th>
<th>Power Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB</td>
<td>CE</td>
<td>Temperature:</td>
<td>Dual redundant slots</td>
</tr>
<tr>
<td>cTUVus</td>
<td>FCC</td>
<td>- Operating 0°C to 40°C</td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>VCCI</td>
<td>- Operating 0°C to 40°C</td>
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<tr>
<td>CU</td>
<td>ICES</td>
<td>- Operating 0°C to 40°C</td>
<td></td>
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<tr>
<td></td>
<td>RCM</td>
<td>- Operating 0°C to 40°C</td>
<td></td>
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</tbody>
</table>

- **Altitude:** Up to 3200m
- **FCC**
- **VCCI**
- **ICES**

### Table 1 - Part Numbers and Descriptions

<table>
<thead>
<tr>
<th>OPN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MQM8790-HS2F</td>
<td>Mellanox® Quantum™ HDR InfiniBand Switch, 40 QSFP56 ports, 2 Power Supplies (AC), unmanaged, standard depth, P2C airflow, Rail Kit</td>
</tr>
<tr>
<td>MQM8790-HS2R</td>
<td>Mellanox® Quantum™ HDR InfiniBand Switch, 40 QSFP56 ports, 2 Power Supplies (AC), unmanaged, standard depth, C2P airflow, Rail Kit</td>
</tr>
<tr>
<td>MTEF-PSF-AC-C</td>
<td>200G 1U systems 1100W AC Power Supply w/ P2C air flow</td>
</tr>
<tr>
<td>MTEF-PSR-AC-C</td>
<td>200G 1U systems 1100W AC Power Supply w/ C2P air flow</td>
</tr>
<tr>
<td>MTEF-FANF-C</td>
<td>200G 1U systems fan module w/ P2C air flow</td>
</tr>
<tr>
<td>MTEF-FANR-C</td>
<td>200G 1U systems fan module w/ C2P air flow</td>
</tr>
</tbody>
</table>

*P2C is connector side outlet, C2P is connector side inlet.*