



# TILEncore-Gx36-Q40 Intelligent Application Adapter

One QSFP Ethernet Port with PCI Express 3.0

The TILEncore-Gx36-Q40™ intelligent application adapter is a very high-performance networking and computing platform designed to unleash the performance and throughput of embedded systems and servers. The massive computing power of the TILE-Gx™ processor is complemented by a 40Gbps Ethernet port (QSFP) and large memory capacity in a compact, power-efficient PCIe form factor. TILEncore-Gx36-Q40 improves total server performance and server density by offloading networking workloads from the host CPU.

The TILEncore-Gx36-Q40 platform works with Mellanox's industry-leading Multicore Development Environment™ (MDE) software, providing standard Linux development and ease of programming across the entire line of TILEncore-Gx™ adapters, including models with 36 and 72 cores.

## POWERFUL COMPUTING PLATFORM

The TILEncore-Gx36-Q40 is comprised of the TILE-Gx processor (including its memory) and the interface subsystem with a QSFP connector. The 36-core TILEGx36™ processor brings wire-speed, 40Gbps deep packet processing to the most demanding applications. The processor is supported by up to 8GBytes of DDR3 memory with ECC and is powered through the PCIe fingers.

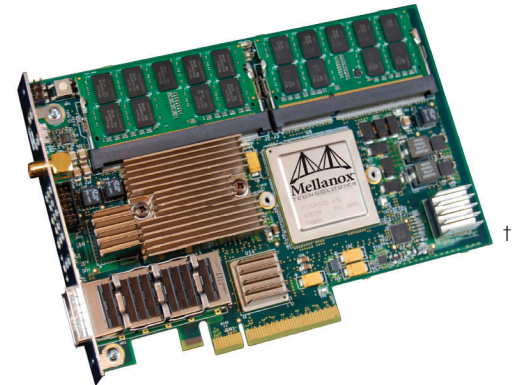
The adapter is typically installed into a Linux x86 host desktop or rackmount server.

## HIGH-SPEED I/O

The rear plate includes a 40Gbps QSFP Ethernet port. In addition, a USB 2.0 port is included to support debug and management operations. An SMA connector can take 1PPS input for packet timestamping (future feature). An 8-lane PCIe Gen3 edge connector provides the interface between the host system and the TILE-Gx36's 48Gbps of peak PCIe throughput.

## TYPICAL USER APPLICATIONS

- 40Gbps intelligent offload Network Interface Card (NIC) for optimized hardware deployment
- Server acceleration for NFV, firewalls and content delivery applications
- Acceleration of networking appliances with optimized Packet Capture, DPI, and IPS/IDS implementation



## HIGHLIGHTS

### BENEFITS

- Massive computing power
- Large memory capacity
- Improves total server performance and server density by offloading networking workloads from the host CPU
- High-performance networking and computing platform

### FEATURES

- Supports INTx and MSI interrupts across PCIe
- On-board ambient and die temperature sensors
- RS-232 (UART) port accessed via a 3-pin header
- On-board voltage and current measurement of power supplies

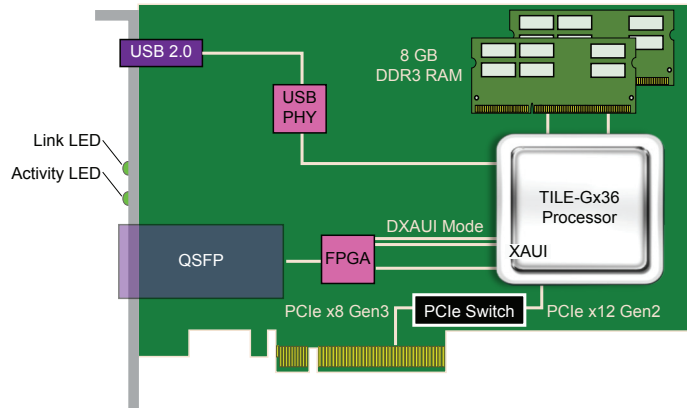


Figure 1. TILeNcore-Gx36-Q40 Block Diagram

## SPECIFICATIONS

### General

- Full-height, half-length, single-slot PCI Express
- RoHS-6 compliant per EU 2011/65/EU

### PCIe Interface

- Eight-lane PCIe 3.0, Gen3 compliant
- Fall-back to 4, 2, or 1 lane
- Fall-back to Gen1/Gen2 mode

### Network Interface

- One QSFP port, 40Gbps Ethernet

### Console Interface

- One USB 2.0 endpoint port for development and debug

### Memory

- Two SO-DIMM sockets for DDR3 with ECC
- Up to DDR3-1333, 8GB total

### Technical Features

- Supports INTx and MSI interrupts across PCIe
- On-board ambient and die temperature sensors

### Supported Operating Systems (Host)

- CentOS 6 and 7
- RHEL 6 and 7
- FreeBSD

### Application Performance

- Maximum packet throughput: 60mpps
- TCP/IP performance: 40Gbps @ 16 tiles
- PCIe throughput (64B packets): 48Gbps
- L4-L7 DPI: 20Gbps
- vSwitch offload 300B packets: 40Gbps
- SSL: 40Gbps
- IPsec: 35Gbps

### Cooling

- Passive cooling heatsink
- Requires 400lfm @ 45°C ambient temperature\*\*

### Indicators

- LEDs on rear plate for Ethernet link status and activity

### Power

- Power supplied via gold-finger PCI connector
- Typical power dissipation: 50W @ 1.2GHz
- Maximum power dissipation: 65W

### Environmental

- Operating temperature: 0°C to 45°C
- Storage temperature: -40°C to 70°C
- Humidity: 10% to 90% RH non-condensing

### Physical Specifications

- Board height: 4.38 in (11.1 cm)
- Board length: 6.6 in (16.8 cm)
- Bracket height: 4.72 in (12 cm)

\* This section describes hardware features and capabilities. Please refer to the driver and firmware release notes for feature availability.

\*\* The 45°C temperature represents the ambient temperature inside the chassis.

Table 1 - Part Number and Description

OPN	Description
TLB4-03680-12-PCIe-1S40-8-P	TILeNcore adapter with 1.2GHz Gx36 processor, 1x40GE QSFP port, 8GB DIMM and crypto acceleration