

Nallatech 520N-MX

HBM2 Enabled Acceleration Card



The Nallatech 520N-MX is an OpenCL-programmable PCIe accelerator featuring Intel's Stratix 10 MX FPGA which is ideal for 100G line rate network packet processing and compute-intensive data center applications that demand high memory bandwidths.

- **Intel Stratix 10 MX FPGA**
- **Up to 8 GB Integrated HBM2 High Bandwidth Memory @ 512 Gbps**
- **Four QSFP28 cages supporting up to 100G per port**
- **Two DIMMs supporting: DDR4 SDRAM, QDR-II+ SRAM or Intel Optane 3D-XPoint**
- **Two OcuLink ports for direct expansion to NVMe SSD arrays**
- **Board Management Controller for Intelligent Platform Management**

The Stratix 10 MX helps these demanding workloads avoid I/O bottlenecks with up to two million logic elements directly connected to multiple banks of in-package High Bandwidth Memory (HBM2).

A novel, flexible memory architecture allows a broad range of memory types to be coupled to the FPGA fabric: QDR-II+ SRAM, DDR4 SDRAM, Intel Optane 3D-XPoint and NVMe SSDs.



Intel Stratix 10 MX FPGA accelerator featuring in-package HBM2 for high memory bandwidth applications



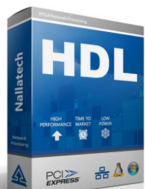
OpenCL

» Intel FPGA OpenCL Software Development Kit (SDK)

- Abstraction enables faster and higher level software development flow
- Emulate OpenCL application code on x86 platforms in seconds
- Push button flow generates FPGA executable, driver and API
- Add optimized HDL IP cores to OpenCL designs as libraries

» Hardware Description Language (HDL)

- Traditional VHDL/Verilog tool flow support
- Aimed at hardware-orientated customers
- Hand-code HDL for ultimate performance
- FPGA card designed to support standard Intel IP cores for Stratix 10



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Form Factor

- » Full-height, double-width PCI-Express card
- » 4.376 x 10.5 inches (111 x 266.7 mm)

Host Interface

- » 16-lane PCI-Express Gen 3.0
- » Actual performance is host computer chipset and operating system dependent

Processing

- » Intel Stratix 10 MX
- » Standard product is MX1650 in an F2597 package
- » Up to 8GBytes on-chip High Bandwidth Memory (HBM2) DRAM (2 x 4GBytes)
- » Core speed grade -2: I/O speed grade -2
- » Contact Nallatech for other Stratix 10 MX options

External Memory

- » Two 288-pin DIMM slots each fitted with 16GB modules by default, i.e., 32GB total on board (options up to 256GB total)
- » Contact Nallatech for QDR-II+ & Intel Optane (3D-Xpoint) DIMM options

Application Development

- » Supported design flows - Intel FPGA OpenCL SDK & HDL
- » OpenCAPI support, Contact Nallatech for latest details

Electrical

- » On-card power derived from 12V PCIe slot & two AUX connectors (one 8-pin, one 6-pin)
- » Power dissipation is application dependent
- » Typical power consumption ~225W
- » Card designed to deliver up to 300W power consumption

Quality

- » Manufactured to ISO9001:2015 IPC-A-610-Class III
- » RoHS compliant
- » CE, FCC & ICES approvals

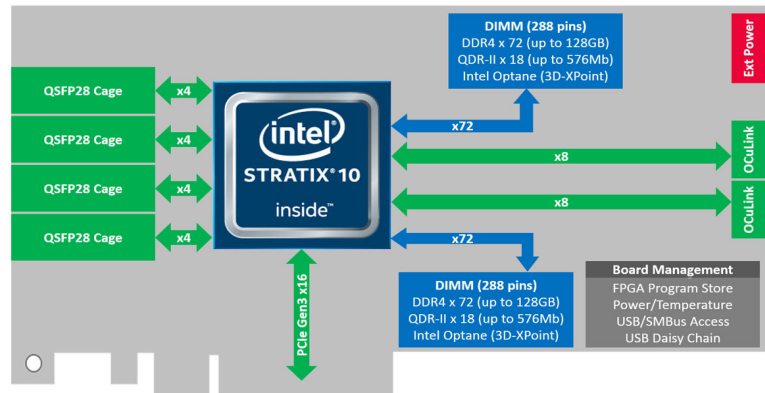
Power Supply Monitoring & Reporting

- » USB/SMBus/FPGA access to board mgmt controller
- » Field upgradable - program on-board flash
- » Power / temperature monitoring & VPD PROM

Customization: Technical specifications (e.g. FPGA type, size, external memory capacity etc.) can be modified to meet the exact needs of commercial customer applications as off-the-shelf product available to the general market.

Integrated servers: Nallatech accelerator cards are available pre-integrated in server platforms from leading vendors.

Application optimization: Nallatech provides consultancy services assisting customers in the porting, optimization and benchmarking of applications executed on Nallatech FPGA accelerators.



Four 100/40/25/10G QSFP28 Network Ports

- » Flexible low jitter clocking supporting multiple telecoms standards - 100/40/25/10G
- » Each QSFP28 can be independently clocked
- » Network recovered clocking supported
- » Clocking options user programmable

Other I/O

- » Two OCuLink connectors each with 8 serial lanes for PCIe 3.0 (Contact Nallatech for 25Gbps support)

Cooling

- » Standard: double-width active heatsink (with fan)
- » Optional: double-width passive heatsink
- » Optional: double-width liquid cooling

Environmental

- » Operating temperature: 5°C to 35°C

Deliverables

- » 520N-MX FPGA card
- » USB cable (front panel access)
- » Built-In-Self-Test (BIST)
- » OpenCL "HPC" Board Support Package (BSP)*
- » 1 year access to online support lounge
- » 1 year hardware warranty

Nallatech's PCIe compliant FPGA boards rely on the host's cooling capabilities to stay within its acceptable operating temperature limits.

The user must make sure that the FPGA application is designed within the power limits documented by Nallatech and that sufficient cooling is provided to make sure the maximum FPGA die temperature is 15C below the maximum operating limit. Nallatech recommends that users perform a thermal characterization of their application in their system to meet these requirements.

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