

# Proc10N

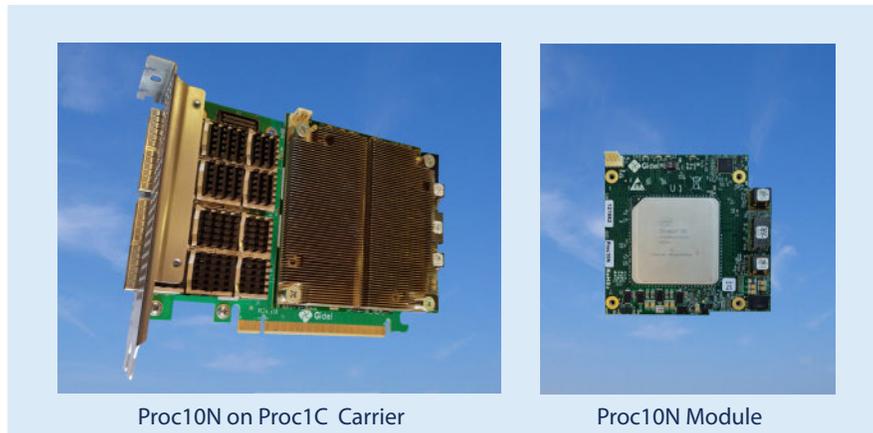
## Ultra-High Performance Stratix10NX HBM2 Module, Ideal for AI



June 2021

### Key Features

- Stratix 10NX 2100 FPGA:
  - 143 / 286 INT8 / INT4 TOPS or 143 / 286 Block FP16 / FP12 TFLOPS ideal for AI and array processing
  - Ultra-high bandwidth 8 GB HBM2
  - 2,073,000 LEs
- Ultra-compact module (97.4mm x 101mm / 3.83" x 3.98")
- Flexible usage via customized carrier board or via Gidel's carrier board
- 5-level memory scheme (50 TB/s+):
  - 50 TB/s access to MLABs
  - 41 TB/s access to M20Ks
  - 90 GB/s access to SRAMs
  - 400 GB/s access to DRAMs
  - Max capacity > 512 GB
    - √ 8 GB on module
    - √ 512 GB (Optane) or 128 GB (RDIMM) on carrier
- 72 Transceivers with bandwidth > 1,600 Gb/s (TX+RX):
  - 48 x up to 26 Gb/s
  - PCIe Gen3 x16
  - 8 x up to 16 Gb/s
- 374 I/Os
- PLLs with jitter cleaners (100fs)
- 10 dedicated input reference clocks
- 2 x output reference clock
- Max power utilization: 120W (@12V)
- Active or passive cooling and heating
- May be used on half-length PCIe carrier board
- Supported by Gidel Proc Dev Kit and ProcVision Suite
- Eco-system enabling multi-applications to simultaneously use FPGA



Proc10N on Proc1C Carrier

Proc10N Module

The Intel® Stratix® 10 NX FPGA incorporates embedded Tensor blocks and integrated HBM2 memory offering an unprecedented level of processing and memory bandwidth performance. The Tensor blocks achieve 143 INT8 TOPS / FP16 TFLOPS, 15X more compute performance than today's powerful Stratix 10 MX. The ultra-low latency 3-D stacked HBM2 DRAM offers 10X more DRAM and SRAM bandwidth than discrete DDR4 and QDR memories.

Gidel's Proc10N module is exceptionally compact and offers 1,600 Gb/s of fully customizable IO interface enabling diverse applications to access this exceptional technology. The Proc10N is ideal for AI, compute-intensive, and low-latency high-bandwidth applications, including:

- **Broadcasting, Image-Processing and Video Analytics:** grabbing from 100+ high-bandwidth sensors with real-time image processing, compression and AI application, all running on a single FPGA
- **Security:** deep packet inspection, fraud detection, etc.
- **5G and Radar:** high-bandwidth real-time edge computing
- **Natural Language Processing:** speech recognition and speech synthesis

Customized solutions can be developed within a remarkable short time and at reduced risk and cost using the Proc10N module, Gidel/user carrier boards, and Gidel's powerful development suite. Gidel's suite tremendously simplifies the development on FPGA and significantly improves system integration and reliability. The suite includes the InfiniVision IP tailored for efficient and reliable capture from 100+ sensors concurrently.

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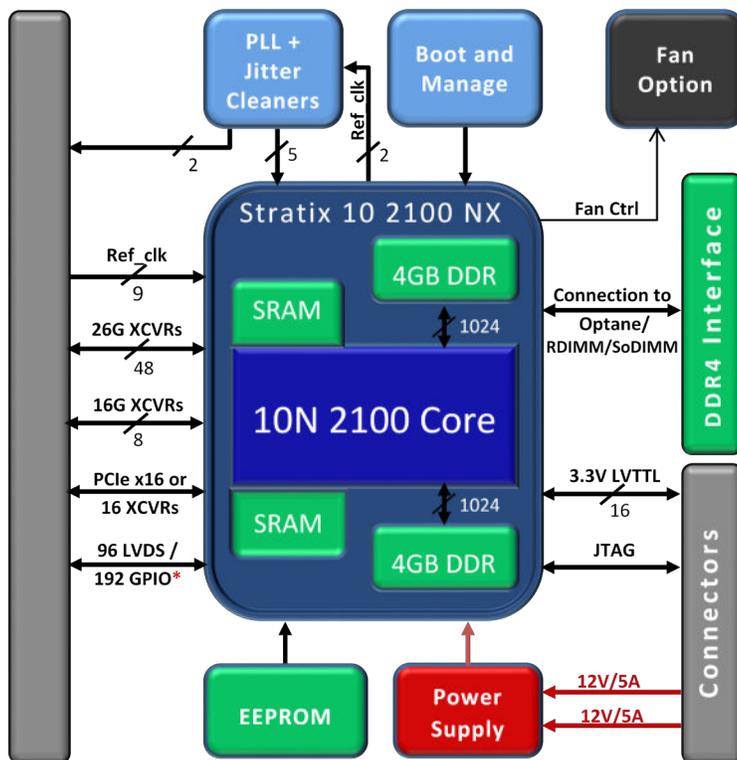


## Proc10N Carrier Boards

The Proc10N module has been designed for use with carrier boards enabling to quickly tailor the peripheral I/O interface without the need to invest valuable resources in developing FPGA infrastructure and its encompassing ASP. User carriers may incorporate any combination of Rx, Tx or full duplex transceivers. Gidel's off-the-shelf carrier board can be used as is for deployment or as a starter's board for initiating immediate development. The Proc1C, Gidel's first carrier board, is a half-length PCIe board comprising PCIe x16, 4 x QSFP28, PHS and GPIOs. The QSFPs can also support grabbing from 16 x 10/25 GigE Vision cameras. The PHS interface enables connecting board-to-board or mounting a daughter board such as Gidel's 8 x CoaXPress-12.

## Gidel Development Suite

- Significantly reduces development time and cost while preserving optimized performance.
- Enables immediate building of ASP (Application Support Package) optimized to the system requirements by mapping the board resources to the application needs.
- Enables multi-design implementations on the FPGA and simultaneous application access to the FPGA. For example, firewall and compression may be accelerated simultaneously on the same FPGA and controlled by independent applications.



**Proc10N Block Diagram**

\* Design may implement a combination of LVDSs and GPIOs

Memory	Units	Total Capacity	Max Total Throughput
MLAB	17 K	11 Gb	50 TB/s
M20K	6.8 K	134 Gb	41 TB/s
eSRAM	2	94.5 Mb	90 GB/s
HBM2 DDR	2	8 GB	400 GB/s
DDR4 on carrier board	1	Up to 512 GB (Optane)	15 GB/s

**Memory Performance**

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