

# CERTUS™-NX

## Reinventing the Low-Power General Purpose FPGA

Built on the 28 nm FD-SOI Lattice Nexus™ platform, the Certus-NX family of FPGAs lead the general-purpose FPGA market in I/O density, delivering up to twice the I/O density per mm<sup>2</sup> in comparison to similar competing FPGAs, and provide best-in-class power savings, small size, reliability, instant-on performance, and support fast PCI Express (PCIe) and Gigabit Ethernet interfaces to enable data co-processing, signal bridging, and system control.

Certus-NX FPGAs target a range of applications, from data processing in automated industrial equipment to system management in communications infrastructure.

### Key Features




- 3x smaller footprint, with PCIe and GigE support: Smallest package in each density at 6 x 6 mm, compared to similar competing FPGAs. Enables PCIe and GigE implementation in smallest footprint (6 x 6 mm).
- 2x more I/O per mm<sup>2</sup>: Highest I/O count per package, with up to 2x more I/O per mm<sup>2</sup> than competition.
- High-speed Interfaces: Up to 70% faster differential I/O (vs. similar FPGAs) at 1.5 Gbps. 5 Gbps PCIe, 1.25 Gbps SGMII (GigE) and 1066 Mbps DDR3 memory interfaces also supported.
- Design security: ECDSA bitstream authentication, coupled with robust AES-256 encryption.
- Lattice Nexus Platform advantages:
  - Up to 4x lower power vs. similar FPGAs.
  - 100x higher reliability, due to 100x lower Soft Error Rate (SER) from 28 nm FD-SOI technology.
  - Instant-on configuration: I/O configures in 3 ms, and full-device as fast as 8 ms.

Features		Certus-NX-17	Certus-NX-40
Logic Cells		17K	39K
EBR (Mbits)		0.4	1.5
Large RAM Blocks (Mbits)		2.5	1
DSP (18 x 18 Mults)		24	56
PLLs		2	3
Hard Blocks		5G PCIe <sup>1</sup> , SGMII CDR, ADC	
Packages		IO Count (WR, HP, ADC) <sup>2</sup>	
121csfBGA (0.5 mm)	6 x 6 mm	78 (24, 48, 6)	82 (24, 58, 0), x1 PCIe
196caBGA (0.8 mm)	12 x 12 mm		157 (93, 58, 6)
256caBGA (0.8 mm)	14 x 14 mm		192 (112, 74, 6), x1 PCIe

<sup>1</sup> Available on Certus-NX-40

<sup>2</sup> WR: Wide-Range I/O, HP: High-Performance I/O, ADC: Dedicated ADC inputs

# Competitive Comparison

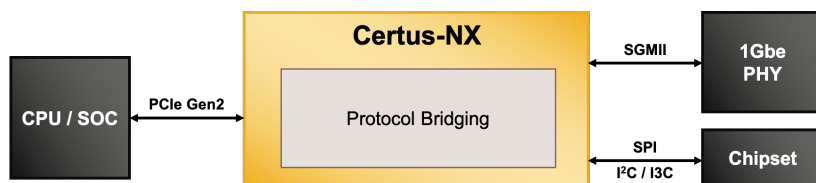
Introduced in 2020		Introduced in 2011*	Introduced in 2011*
 ← 6 mm →		 ← 10 mm →	 ← 11 mm →
<b>Certus-NX 40K LC</b>		<b>Xilinx Artix-7 50K LC</b>	<b>Intel Cyclone V GT 77K LC</b>
<b>3X Smaller Size</b>	6 x 6 mm	10 x 10 mm	11 x 11 mm
<b>2X more I/O</b>	I/O per mm <sup>2</sup> = 2.3	I/O per mm <sup>2</sup> = 1.1	I/O per mm <sup>2</sup> = 1.1
<b>70% Faster I/O</b>	Diff I/O speed = 1.5 Gbps	Diff I/O speed = 1.25 Gbps	Diff I/O speed = 840-875 Mbps

\*Latest introduction of comparable devices  
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## Key Applications

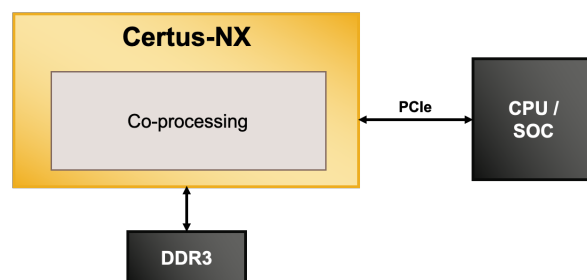
### PCIe to SGMII Bridge

- Bridge processor to SGMII via PCIe Gen2
- Compact packages as small as 6 x 6 mm with PCIe and SGMII support
- Hard blocks for PCIe Gen2 and SGMII CDR eases development



### Co-processing

- Off-load CPU by using Certus-NX as a co-processor to accelerate complex functions
- DDR3 & LPDDR2 interface support (up to 1066 Mbps) and on-chip embedded memory (up to 2.9 Mbit) provide multiple options for data buffering
- Compact packages as small as 6 x 6 mm with PCIe and DDR memory interface support



### Applications Support

[www.latticesemi.com/support](http://www.latticesemi.com/support)

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