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^2 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

■ **Smallest Form Factor**
  - 3x smaller than competition.
  - Package sizes as small as 6 mm x 6 mm.

■ **High I/O**
  - Highest I/O count per package.
  - Up to 2x more I/O per mm^2 than competition.

■ **High-speed Interfaces**
  - Up to 70% faster differential I/O (vs. similar FPGAs) at 1.5 Gbps.
  - Supported interfaces: 5 Gbps PCIe, 2.25 Gbps SGMII (GigE) and 1066 Mbps DDR3 memory.

■ **Design security**
  - ECDSA bit stream authentication.
  - 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[1], SGMII CDR, ADC	
Temperature Grades[3]		C, I, A	C, I, A
Packages		**IO Count (WR, HP, ADC)[2]**	
121csfBGA (0.5 mm)[4]	6 x 6 mm	78 (24, 48, 6)	82 (24, 58, 0), x1 PCIe
196caBGA (0.8 mm)[4]	12 x 12 mm		157 (93, 58, 6)
256caBGA (0.8 mm)[4]	14 x 14 mm		192 (112, 74, 6), x1 PCIe

[1] Available on Certus-NX-40
[2] WR: Wide-Range I/O, HP: High-Performance I/O, ADC: Dedicated ADC inputs
[3] C = Commercial, I = Industrial, A = Automotive
[4] Available in Automotive Grade

Competitive Comparison

	Introduced in 2020	Introduced in 2011*	Introduced in 2011*
	Certus-NX 6 mm	XILINX ARTIX-7 Certus-NX 10 mm	intel Cyclone® V GT Certus-NX 11 mm
	Certus-NX 40K LC	**Xilinx Artix-7 50K LC**	**Intel Cyclone V GT 77K LC**
3X Smaller Size	6 x 6 mm	10 x 10 mm	11 x 11 mm
2X more I/O	I/O per mm^2 = 2.3	I/O per mm2 = 1.1	I/O per mm2 = 1.1
70% Faster I/O	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
All third-party trademarks are property of their respective owners
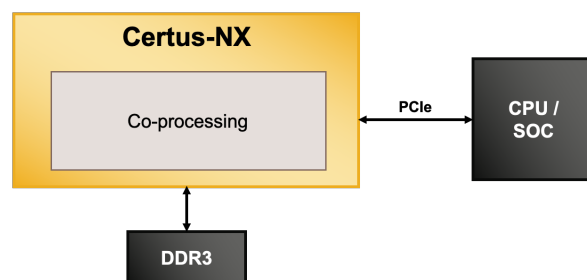
Key Applications

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
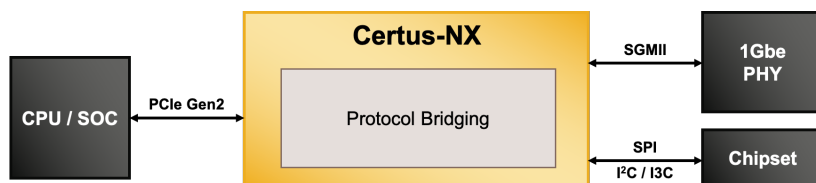
Co-processing

■ 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