

# Certus™-NX-RT & CertusPro™-NX-RT

## Radiation-Tolerant, Low-Power FPGAs for Mission-Critical Space Systems

Frontgrade's Certus™-NX-RT and CertusPro™-NX-RT FPGAs deliver 100 krad(Si) TID and  $\leq 80$  MeV-cm<sup>2</sup>/mg Single Event Latchup immunity of radiation-tolerance, low-power processing ideal for mission-critical space systems where reliability, size, and efficiency are paramount.

Built on the Lattice Certus™-NX architectures, they offer 40k to 96k logic cells, up to 156 multipliers, and 7.3 Mb of embedded memory, giving designers the performance headroom needed for advanced onboard computing without sacrificing power budget. Broad memory support, including DDR3/3L, LPDDR2/3, and LPDDR4 at up to 1066 Mbps  $\times$  64-bit, enables high-bandwidth data handling, while extensive I/O options such as PCIe, 10G Ethernet, SpaceFibre, SLVS-EC, and high-voltage LVCMOS simplify system integration across diverse payload and bus architectures.

Reliability features including soft-error detection and correction, ECC-protected memory, an internal configuration scrubber, and dual 12-bit ADCs, help ensure consistent performance in harsh radiation environments, reducing risk and lowering lifecycle cost. Integrated AES-256 encryption and ECDSA authentication strengthen mission security by protecting critical configuration data. Packaged in a lightweight 0.8 mm Sn63Pb37 BGA, these devices enable more compact, thermally efficient designs. Supported by Lattice Radiant® software and Frontgrade's GR-LIB IP, the Certus-NX-RT family accelerates development and delivers one of the smallest, most power-efficient radiation-tolerant FPGA solutions available today.

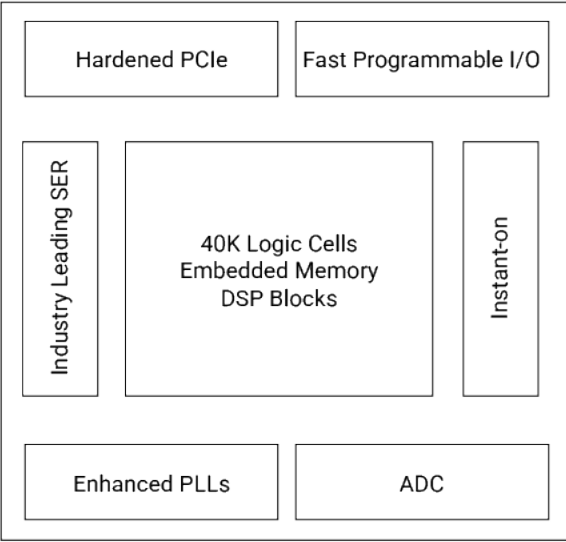


### Features

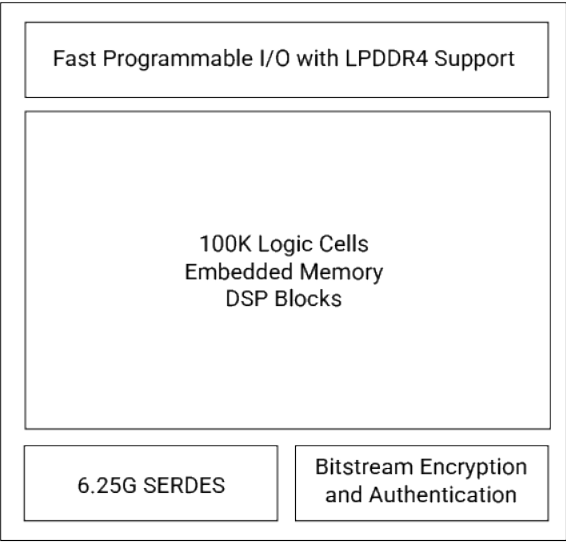
- Radiation-Tolerance: 100 krad(Si) TID, 80 MeV-cm<sup>2</sup>/mg SEL
- Flexible Logic Capacity with support for complex designs
- Up to 7.3 Mb embedded memory, distributed RAM, & DDR3/3L, LPDDR2/3/4
- Interfaces: PCIe Gen1–2, 10GbE, SLVS-EC, SRIO, SpaceFibre, LVDS
- AES-256 encryption & ECDSA authentication
- Screening options include Space PEM L1, L2, QD

### Applications

- Secure, reconfigurable logic for Satellite Payload Processing
- Reliable processing for Spaceborne Control Systems
- Support for PCIe & 10GbE in radiation-prone environments
- High-resolution imaging payloads & video processing



**Certus™-NX-RT High Level Overview**  
Fast Programmable I/O  
Programmable Core  
Instant-on  
Hardened Blocks



**CertusPro™-NX-RT High Level Overview**  
Low Power FPGA Fabric  
High Bandwidth Interfaces  
Optimized for Edge Processing  
Small Form Factor

Specifications

	Certus™-NX-RT	CertusPro™-NX-RT
Process Technology	28nm FDSOI	28nm FDSOI
Logic Cells	39K	96K
Embedded Memory	2.9Mb	7.3Mb
Supply Voltage (V)	1.0 Core, 1.8V Aux	1.0 Core, 1.8V Aux
I/O Voltage (V)	1.0 – 3.3	1.0 – 3.3
PLL	3	4
Primary I/O	LVDS, Soft D-PHY, SGMII, PCIe x4, GbE	LVDS, Soft D-PHY, SGMII, PCIe x8, 10GbE
Supported Memory	DDR2/3L, LPDDR2/3 x8, x16	DDR2/3L, LPDDR2/3/4 x8, x16, x32, x64
Security	Bit stream encryption (AES-256) & authentication (ECDSA)	Bit stream encryption (AES-256 & authentication (ECDSA)
ADC	2x 1 MSPS, 12-bit SAR	2x 1 MSPS, 12-bit SAR
Typical Power (mW)	100	600
Operating Temp (°C)	-40 to 125	-40 to 125
Packaging	256 caBGA (14 x 14 mm) 0.8mm ball pitch	484 BBG484 (19 x 19 mm) 0.8mm ball pitch
TID (krad (Si))	100	100
SEL Immune (MeV-cm2/mg)	≤ 80	≤ 80
Qualification	Space PEM QD	Space PEM QD, PEM-INST-001 Level 1/2

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