NX overview

October, 2024

NanoXplore

European Leader in FPGA and SoC FPGA for Aerospace

- French Based Company
  - Paris
  - Montpellier
- 120+ Employees with more than 90% R&D Engineers
  - 35 employees in 2021
- NX fully supported by European agencies and community :

Advanced products for an advanced market

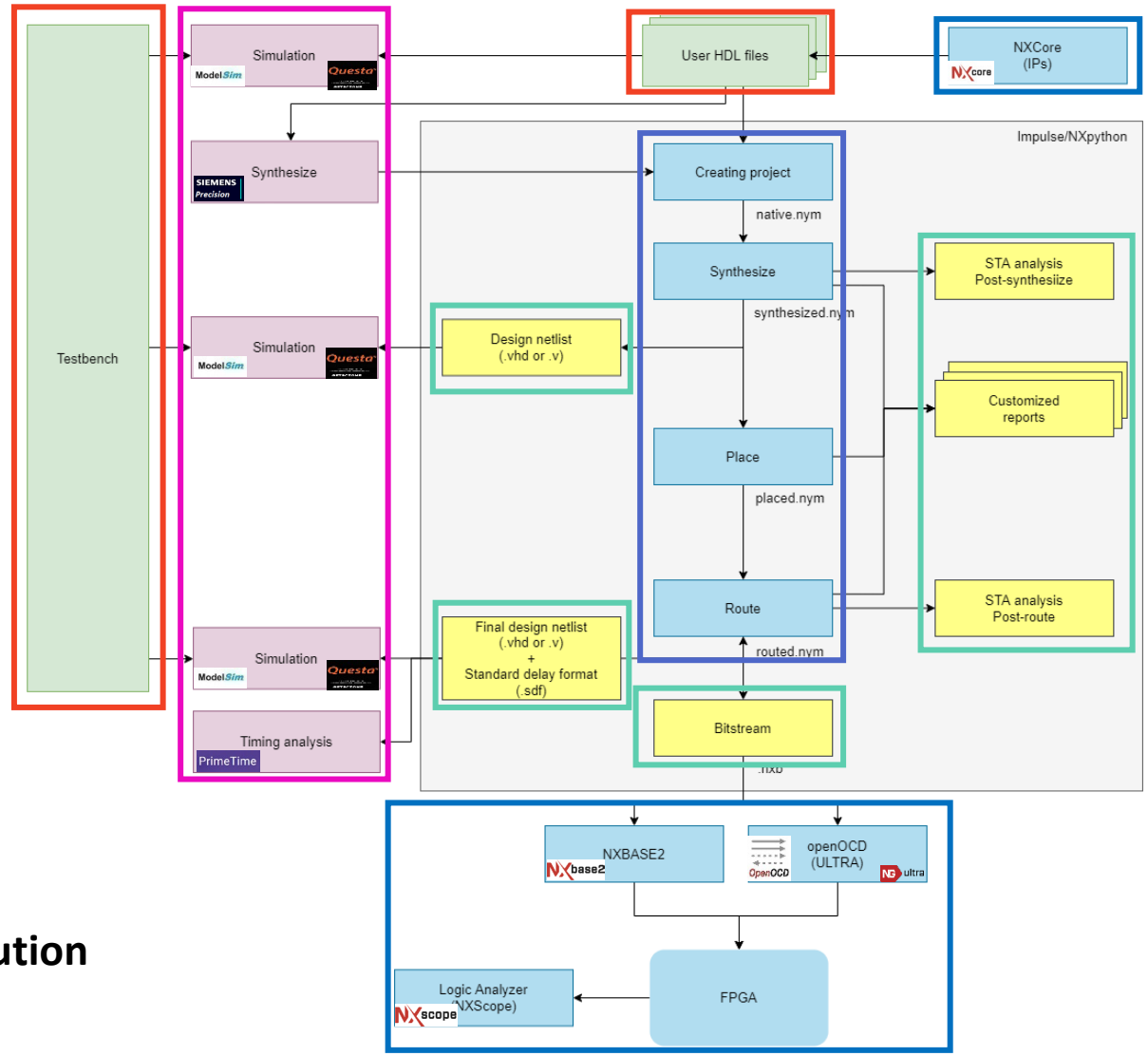
Radiation Hardened	• Amazing radiations results • No need for design mitigations (28 nm)
Local Supply chain	• STMicroelectronics foundry • European Sovereignty • ITAR Free
High Tech	• High Density FPGAs • High Performances • (HSSL)
Security	• Cryptographic Services

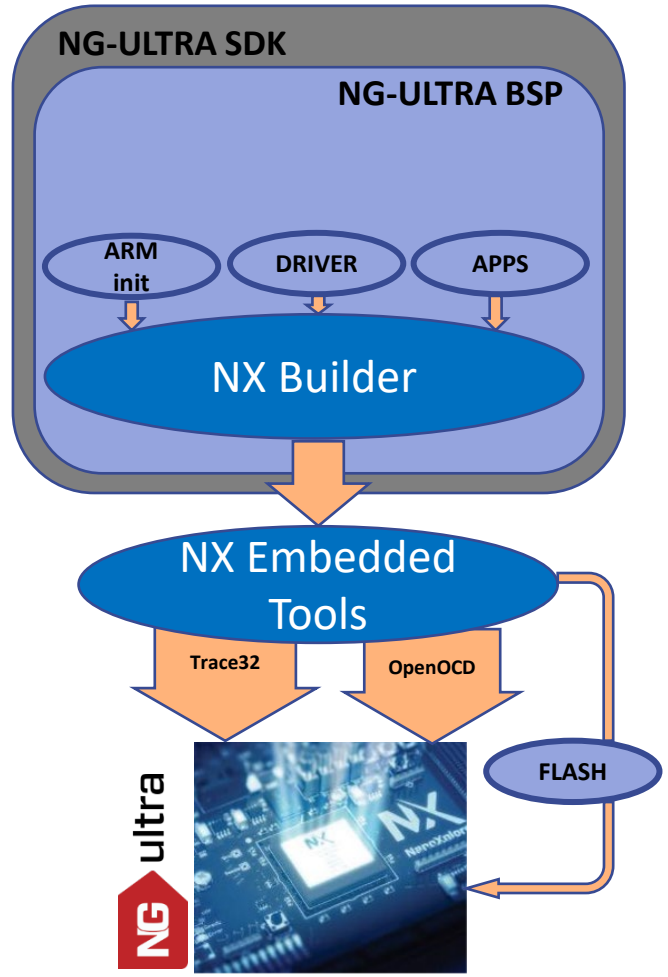
NX Tools & Ecosystem

NanoXplore

NX Design Suite – Overview

User Resources
NX Tools
NX Output Files
Third-Party Tools





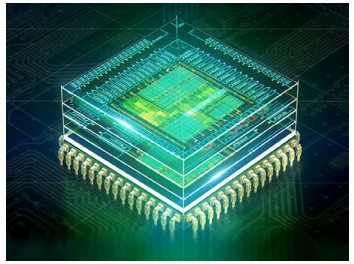
Complete solution

Our Partners

Synthesis Tool

SIEMENS

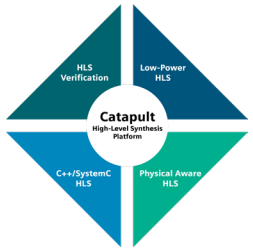
Siemens Precision HI-REL



High Level Synthesis

SIEMENS

Siemens Catapult



MathWorks®

HDL Coder

POLITECNICO MILANO 1863

Bambu

SPACE CODESIGN

SpaceStudio

SPACESTUDIO

Debugging Tools

LAUTERBACH DEVELOPMENT TOOLS

TRACE32

OpenOCD

OpenOCD

NG-ULTRA SW ecosystem

NanoXplore

NG-ULTRA Software eco-system

BSP

NG-Ultra BSP Welcome guide

Introduction

The Board Support Package (BSP) is a bare-metal environment containing:

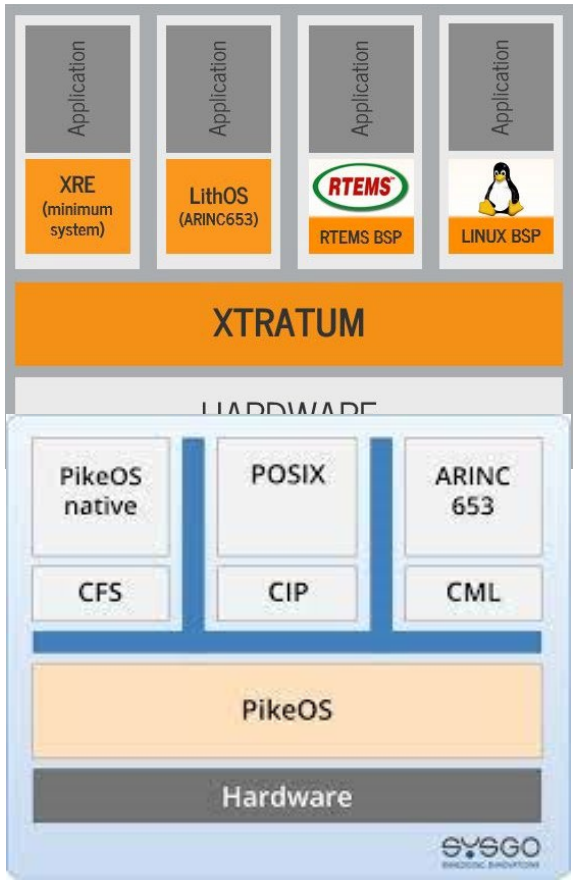
- **drivers** for the NG-Ultra devkit,
- **utils** to abstract hardware capabilities & test
- sample **applications** on board.
- the **nxbuilder** build system

OSs

- Zephyr OS: ported by NanoXplore

- Xtratum by Fentiss: HERMES project H2020:
  - Only V1 HW but it should be transparent on V2
  - XNG Hypervisor
  - **RTEMS6** QDP BSP as partition
  - Guest Linux
  - Baremetal as partition

- PikeOS for MPU by SysGO:

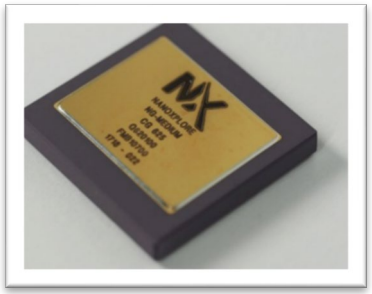


NX products

NanoXplore

NX Products – Overview

NG medium



65 nm

Low-End FPGA

- 35kLUTs/32kDFFs
- 3Mb RAM
- 112 DSP
- No HSSL
- No Hard IP Processor

- Companion chip

ESCC9000 qualified

ultra 300

28 nm

Mid-End FPGA

- 290kLUTs/273kDFFs
- 21Mb RAM
- 896 DSP
- 16x HSSL 12G
- ADC/DAC

- Payload
- Platform
- Sensor control
- Power control loop

NG ultra

28 nm

High-End FPGA

- 537kLUTs/505kDFFs
- 32Mb RAM
- 1344 DSP
- 32x HSSL 12G
- Quad-core ARM-R52 (SoC)

- Payload
- Platform

65 nm | 28 nm

NanoXplore

NG medium

esa

European Space Agency
Agence spatiale européenne

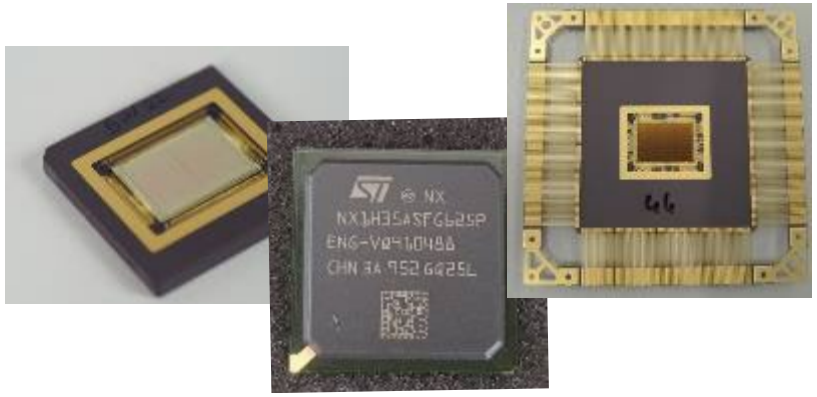
Certificate of Qualification No. 382

This is to certify that NanoXplore, Sèvres , France has been qualified by ESA for the supply of Integrated Circuits, Silicon, Monolithic, 35KLUT Radiation-Hardened FPGA (NG-Medium) , for use in ESA space programmes, according to ESCC Generic Specification 9000 and associated Detail Specification 9304/010 as recommended by the Space Components Steering Board.

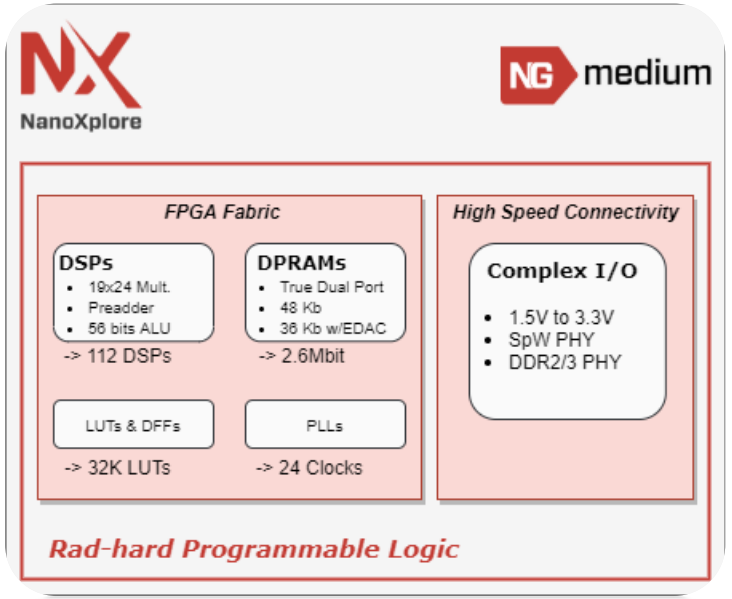
This certificate is valid until August 2024.

Head of the Product Assurance and Safety Department

Date
31 August 2022

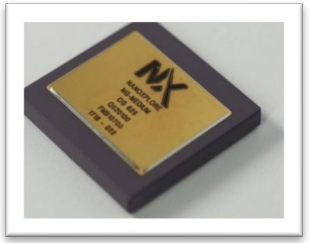


- First Commercial Product
- 65nm technology
- Supply chain running for both space and general applications
- SpW & DDR2 PHY hard-coded



NanoXplore

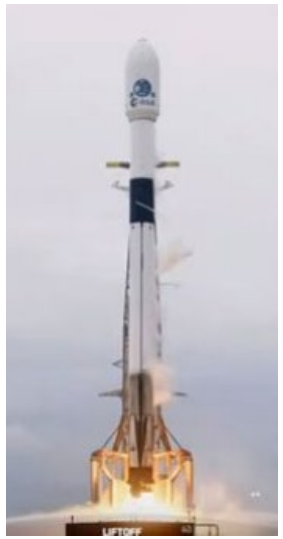
NG-MEDIUM Family



Space qualified FPGA	New space/constellation COTS FPGA
NG medium RH	NG medium JEDEC
ESCC9000	JEDEC
Ceramic QFP-352 & LGA-625	Leadfree Plastic BGA 625
High Level Immunity	High Level Immunity
Space : Class 1 & Class 2	Space Constellations, Avionics, Military & Defense

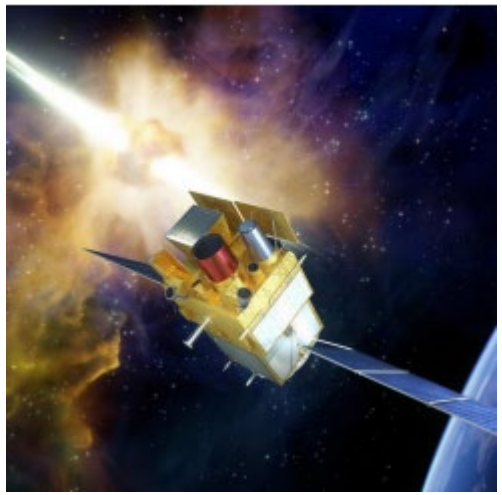
Flight Heritage – DORN (Change'6) & ECLAIRs (SVOM)

- Hera mission (ESA) launch Oct 7th



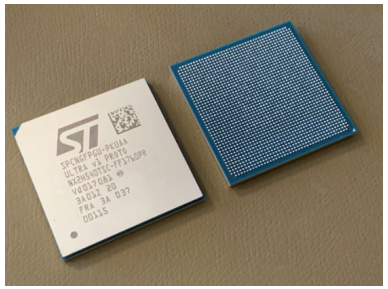
- DORn
  Detection of Outgassing RadoN on the moon

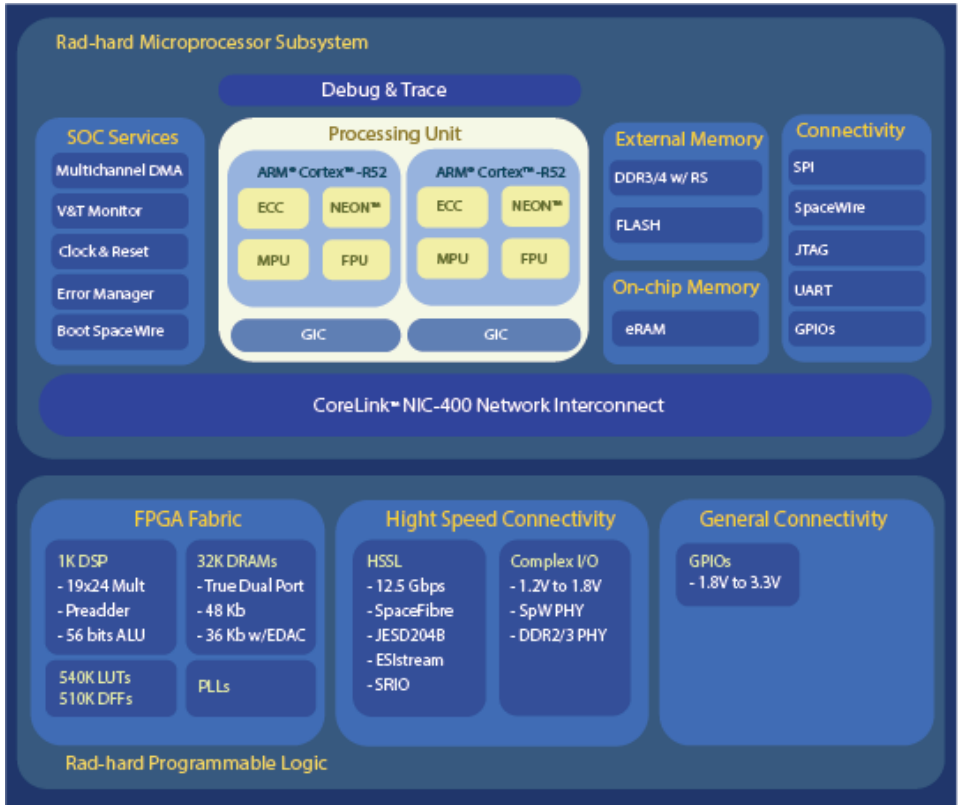
- SVOM
  Space Variable Objects Monitor.
  Study the gamma-ray bursts from explosion of stars (LEO)



- More to come ……

NG-ULTRA





- 2 grades :
  - ESCC9030
  - JEDEC
- Dual SoC component :
  - Quad Cortex-R52 @600MHz
  - FPGA Fabric
- 28nm technology
- Amazing Radiation Testing Results
- Supply chain running
  - First flight models already delivered

NanoXplore

NG ultra

Space qualified FPGA

NG ultra RH

ESCC9030

SnPb Organic BGA 1760

Fully Immune

Space Grade Capacitors

Space : Class 1 & Class 2

New space/constellation COTS FPGA

NG ultra JEDEC

JEDEC

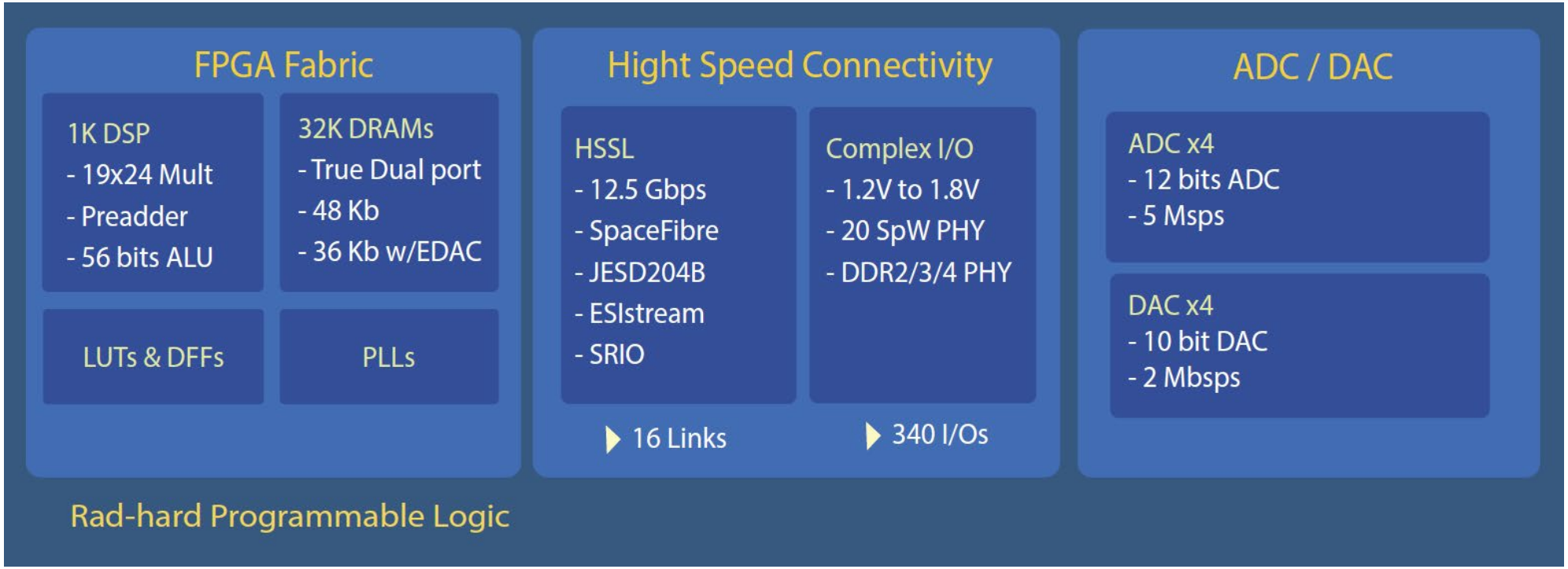
Leadfree Organic BGA 1760

Fully Immune

General Purpose Capacitors

Space Constellations, Avionics, Military & Defense

Ultra 300

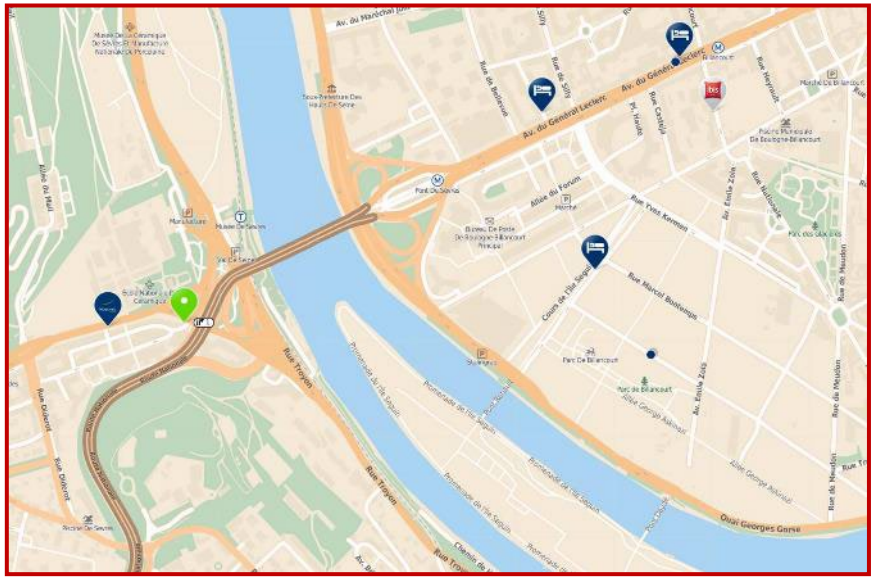


- Our latest product : our All-Rounder
- HSSL @ 12 Gbps, compatible with SpaceFibre, JESD204B, ESIstream, SRIO
- ADC and DAC
- 2 Great Formats : BGA 484 (27mm*27mm) and BGA 1152 (35mm*35mm)
- Benefits from NG-ULTRA experience
  - Radiation / Library / Testing / Supply Chain

Ultra 300 Family

Space qualified FPGA	New space/constellation COTS FPGA
ultra 300 RH	ultra 300 JEDEC
ESCC9030	JEDEC
SnPb Organic BGA 484 & 1152	Leadfree Organic BGA 484 & 1152
Fully Immune	Fully Immune
Space Grade Capacitors	General Purpose Capacitors
Space : Class 1 & Class 2	Space Constellations, Avionics, Military & Defense

Thank you for your time



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