

Components for Data Processing in Space

NanoXplore

European Rad Hard by Design SRAM Based FPGA

NG-medium

34k LUTs
3Mb RAM
112 DSPs
16x SpW & DDR2 PHY

µP Soft IP Leon3 @ 35MHz

NG-large

137k LUTs
10Mb RAM
384 DSPs
20x SpW & DDR2 PHY
24 x HSSL @ 6,25GBps
Hard IP ARM R5 @ 200Mhz

NG-ultra

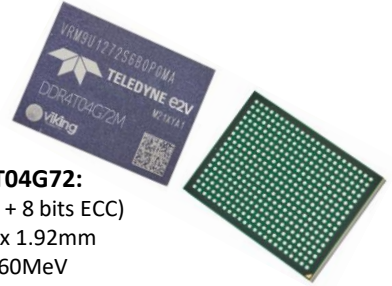
573k LUTs
32Mb RAM
1344 DSPs
20x SpW & DDR 2 & 3 PHY
32 HSSI @ 12,5 GBps
Hard IP SoC DAHLIA
4x ARM R52 @ 600MHz

NG-ultra300

290k LUTs
22Mb RAM
896 DSPs
20x SpW & DDR 2 & 3 PHY
16x HSSL @ 12,5 GBps
µP Soft IP
4x ADC and DAC



DDR4 Memory Module 2.4GT/s



Fault Tolerant DDR4T04G72:

- 4GB; 72 bits (64 bits + 8 bits ECC)
- Size 15mm x 20mm x 1.92mm
- TID 100krad / SEL > 60MeV
- Temp. Range -55°C to 125°C
- Qual Flow Nasa Level 1 and ESA Class 1

EM & EQM
FM

→ available now
→ Q1/2022

Support for interfacing with: Xilinx **KU060** and MPSOC ZYNQ **Ultrascale+** & Microchip **RT Polarfire**



Space Grade Power Solution for the Xilinx® XQRKU060 FPGA

The XQRKU060 FPGA requires a complex power solution with multiple supply rails that require high power, tight tolerances, and power supply sequencing.

In collaboration with Xilinx and Ibeos, Renesas offers a Kintex XQRKU060 development board with the FPGA powered by Renesas' radiation-hardened products.



Serial SPI MRAM Boot Memory - 75krad

64 Mbit

SPI, QSPI or Octal SPI
108 MHz, 3.3V
Low Power 22nm

256 Mbit

SPI, QSPI or Octal SPI
200MHz, 3.3V
Low Power 22nm

1Gbit

SPI, QSPI or Octal SPI
108MHz, 3.3V
Low Power 22nm

4 Gbit

SPI, QSPI or Octal SPI
200MHz, 3.3V
Low Power 22nm

BAE SYSTEMS

64Mb SRAM (2M x 32)

320Mb SRAM (8M x 40)

Read/write access time 12.5 ns
Operating voltage (core) 1.2 V
Operating voltage (I/O) 1.8 V, 2.5 V
TID >100krad, Latchup-immune



Clocking for Processors and FPGAs

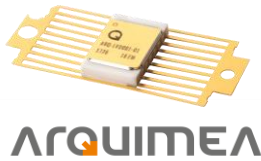
XO / TCXO / VCXO / SAW / MCXO / OCXO
15kHz to 1,5GHz

"New Space" variants also available
or Multiple Output XOs, TCXO locked to PLL and many more

Components for Data Processing in Space

ESCC9000 Qualified LVDS Driver & Receiver

ANSI EIA/TIA644A std
500Mbps Channel data rate
Low Channel skew and jitter
Cold-spares in all pins
TID: 300 kRad(Si) / SEL immune
BER <10⁻¹³ err/bit (GEO Orbit)
Improved compatibility with SpaceWire standard



ARQUIMEA



Power your FPGA and Processor POL and LDOs

ISL70001ASEH

6A Synchronous Buck Regulator
 V_{in} 3V – 5,5V

ISL70002SEH

12A Synchronous Buck Regulator
 V_{in} 3V – 5,5V

ISL70003ASEH

9A Synchronous Buck Regulator
 V_{in} 3V – 13,2V

ISL70005ASEH

Dual Output
3A POL & 1A LDO
 V_{in} 3,3V – 5V

ISL75051ASEH

3A Ultra-Low Dropout Regulator
65mV dropout @ 1A
 V_{in} 2,2V – 6V

ISL75052SEH

1,5A Low Dropout Regulator
75mV dropout @ 0,5A
 V_{in} 4V – 13,2V



Optical Transceivers

12,5Gbps / 28Gbps
4TRx or 12Rx and 12Tx
versions available

Space ADCs

EV12AQ600 Quad 6GSPS
EV12AD550 Dual 1.5GSPS
EV10AS180 Single 1.5GSPS



XQRKU060 Interoperability



The Efficient Serial Interface

Space DACs

EV12DD700 Dual 12b 12GSps
EV12DS130 Single 3GSPS



Power Your Critical Mission Today

Isolated Power (DCDC)

Convert 28V or 50V Bus to 3,3V / 5V / 12V / 15V
Single or Dual Output
1,5W up to 400W
60krad / 44MEV or 100krad / 85MeV
different configurations available



CAN Bus & RS422

ISL72026SEH

CAN Transceiver
3,3V
up to 5Mbps

HS-26CLV31RH

RS-422 Quad Differential Line Driver
3,3V



HS-26CLV32RH

RS-422 Quad Differential Line Receiver
3,3V



Sequencer for Power Rails

ISL70321SEH

V_{in} 3V – 13,2V
Sequence 4 Power rails per Part
unlimited cascade able



Last mile in the development of LS1046-Space Radiation Tolerant Quad ARM® Cortex® A72

EMs and EQMs are available; FM's are planned in June 2022.



TID level of 100 krad,
and is SEL immune
up to 60 MeV.cm²/mg

Full SEE & TID reports
are available on demand.



P2020 Space



Dual PowerArchitecture e500 core,
Up to 1.33GHz, 6kDMIPS, 100krad, SEL Data available

NXP P2020 based, 512 Kbyte L2 Cache with ECC, Gigabit Ethernet, PCIe 1.0, UARTs, SPI, I2C

Available as standalone version,
as well as in its integrated
version, known as Qormino
QLS1046-Space which includes
a Space 4GB Radiation Tolerant
DDR4

