

FEATURE HIGHLIGHTS

INDUSTRY-LEADING PERFORMANCE

The Q8 features a Multi-Processor System-on-Chip (MPSoC), including multi-core CPUs providing 64-bit processor scalability supported by programmable logic resources and a wide array of hardware interfaces.

LOW MASS, VOLUME, POWER

The Q8 measures 80 mm x 80 mm x 11.2 mm and consumes as little as 5 W. Its small size, low mass and power consumption make the Q8 ideal for aerospace applications that demand extremely high performance.

INTEGRATED HYBRID ENVIRONMENT

The application space in a Q8 is a tight integration of a quad core ARM Cortex A53 Application Processing Unit, a dual core ARM Cortex R5 Real Time Processing Unit, and programmable logic featuring 504,000 system logic cells, 461,000 flip flops, 274,000 lookup tables and 1,728 DSP slices reserved for application-specific use.

FLEXIBLE INTERFACING

The Q8 provides Gigabit Ethernet networking through its RJ45 connector along with a USB 2.0/USB 3.1 Gen 1 Host port. The Q8 also provides multiple digital I/O lines, including up to 52 GPIO, 12 MIO, 64 LVDS pairs, USB 2.0 and factory selectable RS-232/422/485 through its mezzanine connector.

OVERVIEW

The Q8 is based on the Xilinx Zynq UltraScale+ MPSoC FPGA. For a modest size, weight, and power increase, it offers additional processing, logic, and I/O capacity over the Zynq 7020-based Q7 processor card. Q-Cards combine a small form factor with broad networking, processing, and I/O capabilities. At the core of each Q8 is a hybrid environment of powerful multi-core CPUs and re-programmable logic, providing flexible and scalable performance.

APPLICATIONS

The extremely high performance and extensive FPGA fabric make the Q8 ideally suited for onboard:

- High resolution camera interfacing and control
- Onboard image processing
- Synthetic Aperture Radar (SAR) processing
- Hyper/multispectral compression
- Image registration and alignment
- Convolutional neural networks
- Advanced Software Defined Radios (SDR)

PRODUCT INTEGRATION MODULE (PIM)

Each Q8 Engineering Model (EM) is delivered with a detachable PIM to facilitate development. The PIM provides standard commercial interfaces (e.g. CAN, RS-232/422/485, 1-Wire, 13 GPIO, 8 analog inputs, 4 analog outputs, JTAG), debug LEDs and other lab development features.

SOFTWARE DEVELOPMENT

Xiphos provides an Application Development Kit with standard Linux libraries for C/C++ to support software development on Linux workstations. Code previously developed for Linux desktop and server applications can be easily ported to the Q8. Q8 hardware and logic interfaces are all accessible through either standard Linux and Xilinx kernel drivers or custom drivers provided by Xiphos.

LOGIC DEVELOPMENT

Logic development uses standard Xilinx development tools. Xiphos, Xilinx and many third party vendors also provide a wide range of compatible reusable logic cores for Xilinx FPGAs.

FLIGHT HERITAGE

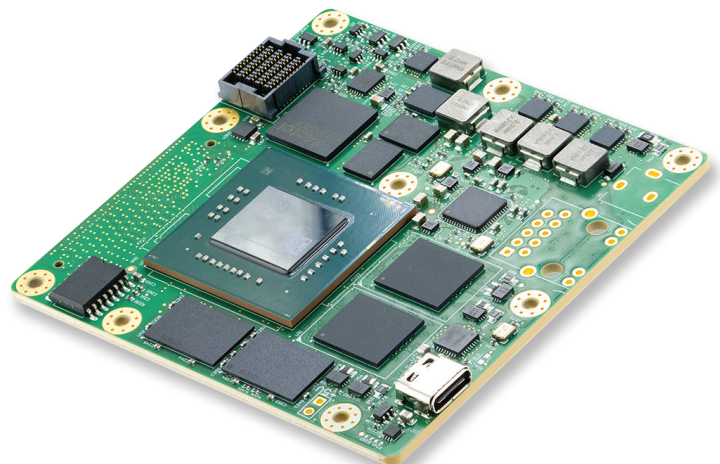
The Q8S, the Flight Model (FM) version of the Q8, has been flying since September 2020.



Other flight heritage products in the current Xiphos Q-Card family include the Q7S and Q8JS.



Xiphos has been flying previous generations of the Xiphos Q-Card family since 2002.



CHARACTERISTICS

MEMORY

- 4 GB LPDDR4 DRAM with EDAC
- 2x 256 MB QSPI Flash (NOR)
- 2x eMMC, 128 GB each, on independent buses / power control

MULTI PROCESSOR SYSTEM ON CHIP

- Xilinx Zynq UltraScale+ XCZU7EG
- Quad core ARM Cortex A53 Application Processing Unit at up to 1.2 GHz
- Dual core ARM Cortex R5 Real Time Processing Unit at up to 500 MHz
- 504,000 system logic cells
- 461,000 flip flops (FF)
- 274,000 lookup tables (LUT)
- 1,728 DSP slices

CONTROL FPGA

- Microchip ProASIC3

OPERATING SYSTEM

- Yocto Linux BSP (LTS distribution)

REAL TIME CLOCK

- RTC with sleep & wake up on alarm/interrupt
- Dedicated power pin for external battery

POWER

- 5 W, typical
- 5 to 15 VDC
- Various power modes (including deep sleep)
- Overcurrent detection & protection (global and local) and brownout protection

FORM FACTOR

- 85.8 mm x 80 mm x 22.6 mm, 64 g (with RJ45 and power connectors)
- 80 mm x 80 mm x 11.2 mm, 56 g (without connectors)

ENVIRONMENTAL

- Operating Temperature derated to -40 to +60 °C

INTERFACES

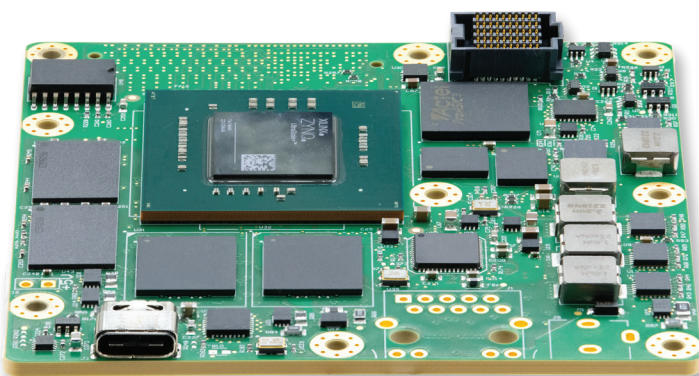
- Power
- Gigabit Ethernet (RJ45)
- 1x USB Type-C Host port (USB 2.0 & USB 3.1 Gen 1)
- CAN Bus controller (in logic)
- Up to 38 single-ended GPIO 3.3 V, 14 single-ended GPIO 1.8 V, 12 MIO
- V, 64 LVDS pairs/128 single-ended GPIO 1.8 V, 3 Gigabit transceivers (SATA, PCI express), USB 2.0, and factory-selectable RS- 232/422/485 (Mezzanine connector)

RADIATION ROBUSTNESS FEATURES

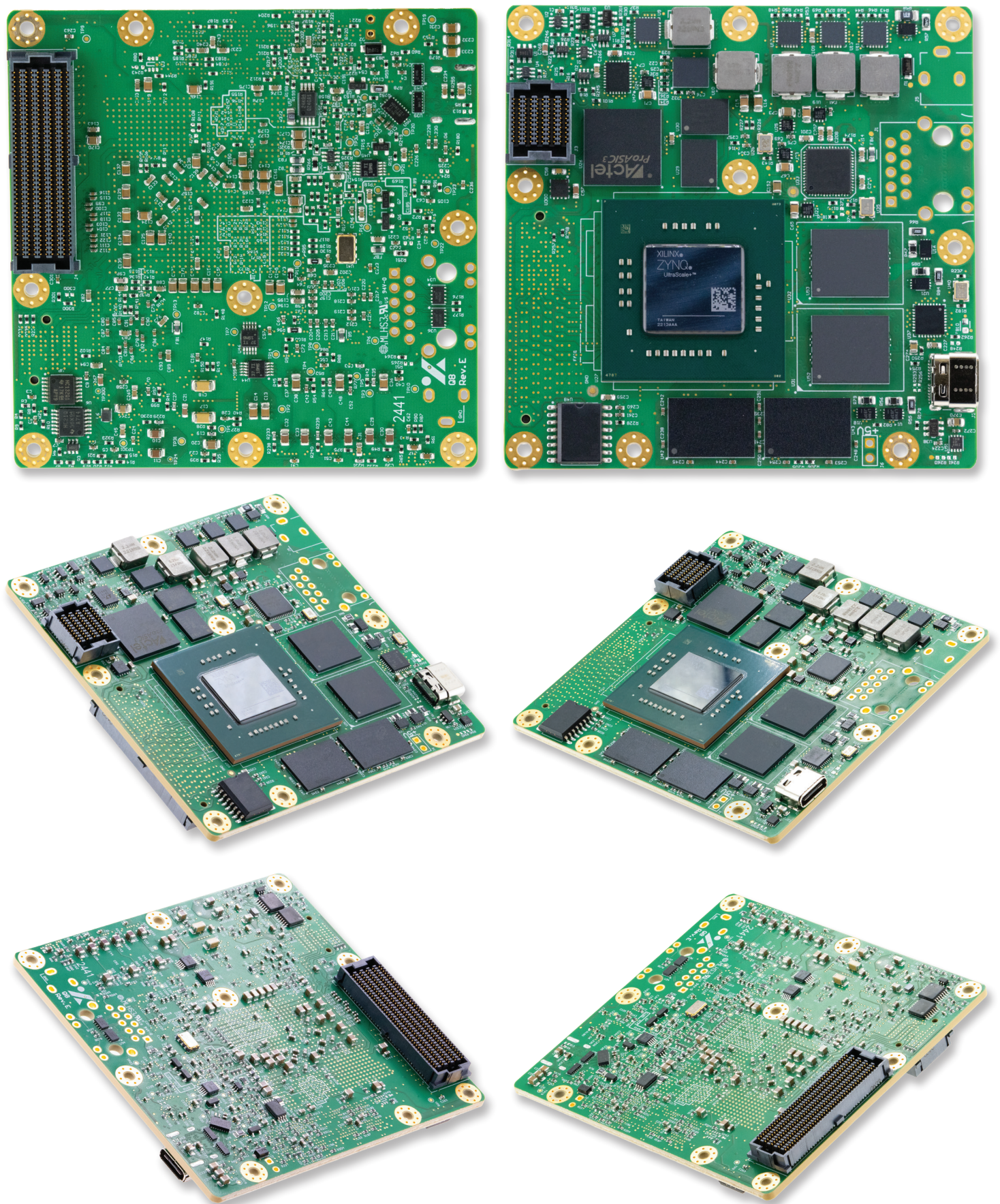
- Triple mode redundancy in Control FPGA
- EDAC-protected RAM
- Upset and multi-current monitoring
- Overcurrent protection (multiple)
- FPGA bit stream scrubbing
- Software robustness/ watchdog

ENGINEERING MODEL (EM) VS. FLIGHT MODEL (FM) OPTIONS

	EM	FM
IPC Class	Class 2	Class 3
Acceptance Temperature Range	Room Temperature	Flight Levels, -40 to +60 °C
Conformal Coating Available	No	Yes
EIDP Available	No	Yes
Extended Warranty Available	No	Yes
PIM & Accessories Supplied	Yes	No



FRONT & BACK



CONFIGURATIONS

Use the QR code at right to be taken to the Q8 product page to [request a quote](#).



Q8-001

- Standard flight model configuration. This model is also available as an engineering model with the same configuration as the flight model to mate with a custom daughter board

Q8-002

- This model is often used as an engineering model as it has an integrated 1G Ethernet RJ45 and power barrel. This allows customers to quickly begin development with minimal lab resources as power is supplied with an A/C power cord.

Q8-003

- Similar to standard configuration Q8-001, but Ethernet PHY built-in to the Q8 is routed to 7mm stack header pins for interface with Ethernet magnetics installed on the customer's daughter board.

Q8-004

- Similar to Q8-003 configuration, but USB2 is routed to the mezzanine connector for customers who want to expose a USB2 interface from their daughter board. The USB2 oscillator is also always enabled.

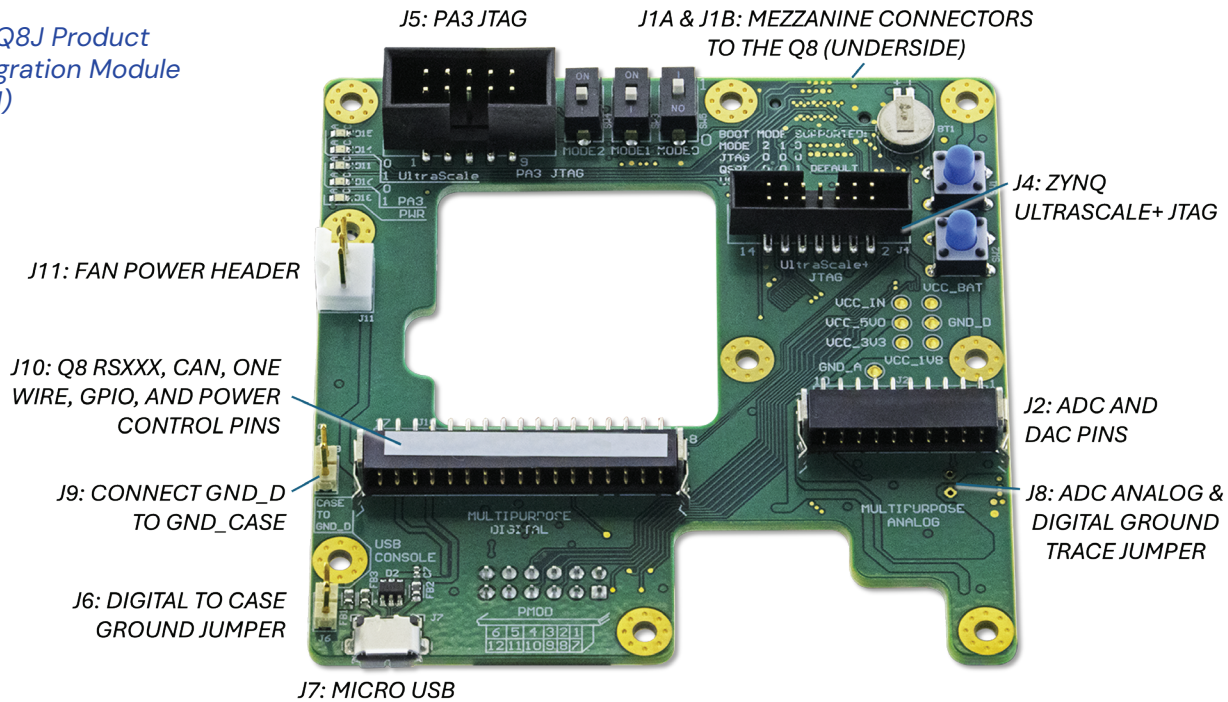
Configuration	Q8-001	Q8-002	Q8-003	Q8-004
EM Uncoated Part Numbers	XS002-10002-001-02-A	XS002-10002-002-02-A	XS002-10002-003-02-A	XS002-10002-004-02-A
FM Uncoated Part Numbers	XS002-10001-005-02-A	N/A	XS002-10001-012-02-A	XS002-10001-013-02-A
FM Conformal Coated Part Numbers	XS002-10001-001-02-A	N/A	XS002-10001-003-02-A	XS002-10001-004-02-A
Power Barrel Connector	Unpopulated	Populated	Unpopulated	
Ethernet connector	Unpopulated	RJ45	7mm stack daughter board header	
Input voltage range	6-15 V			
Startup voltage	4.5 V			
Brownout voltage	4.0 V			
Hardware over-current limit	1 A			
Case GND to Digital GND connection	Open			
USB2 routing	Q8 USB connector J2			Q8 bottom mezzanine connector J4 to daughter board (If used on-orbit, route to daughter board)
USB2 oscillator control	Software controllable through ZYNQ			Always enabled
PUDC (Pull-Up During Configuration)	Pull-up active			
Serial Comms				
Serial port configuration (RSXXX pins)	RS422			
ttyPS0 routing	PIM serial to USB connector			
ttyPS1 routing	Serial port pins in the mezzanine connector)			

Q8 EM INCLUDED ACCESSORIES

Q8 Engineering Models (EM) ship with the following as standard:

- Q8/Q8J Product Integration Module (PIM)
- 12V output wall-mount power supply (for Q8-002)
- Micro-B to USB cable
- USB-C to female USB-A cable

Q8/Q8J Product Integration Module (PIM)



Ethernet Adapter to USB-A Male



12V output wall-mount power supply



USB-C to female USB-A cable



Male Micro USB

WHY CHOOSE XIPHOS?

Faster Time to Launch Using COTS Processing With Heritage

FLIGHT-PROVEN PROCESSORS:

Space-hardened, COTS-based computing solutions deployed across hundreds of commercial, civil and defense missions.

HIGH PERFORMANCE:

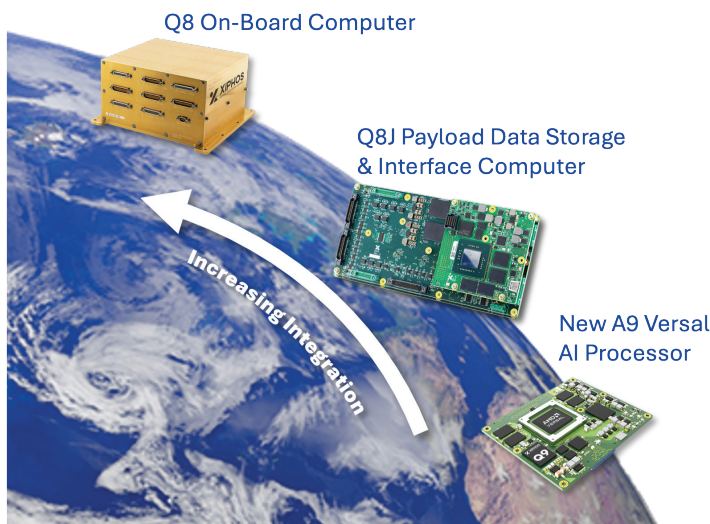
Products offer impressive processing, networking, RF and storage performance by leveraging state-of-the-art commercial devices.

COST-EFFECTIVE PERFORMANCE:

Delivers high performance and reliability at a fraction of the cost of traditional space processors.

SCALABLE SOLUTIONS

Flexibility across the design stack ensures the right level of integration for your use case.



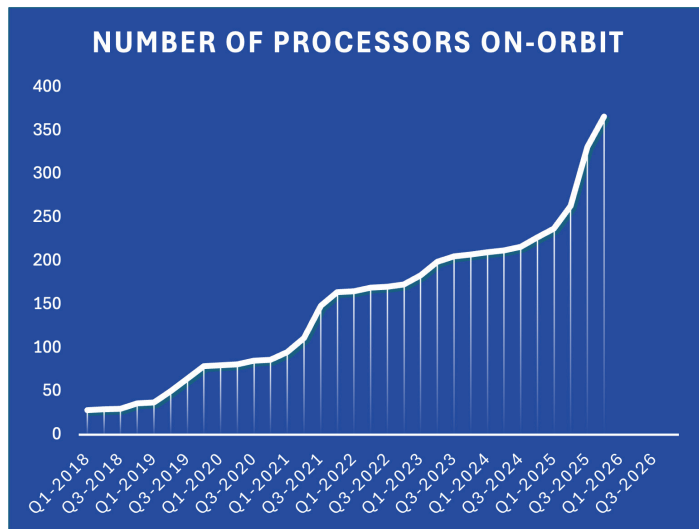
ABOUT XIPHOS

Xiphos, based in Montreal and part of Epiq Solutions since 2023, has over 20 years of experience delivering thousands of low-SWaP-C COTS-based processor cards for space applications including satellites, landers, rovers, and space stations. Known for high reliability, radiation tolerance, and strong customer support, Xiphos specializes in compact processing solutions using cutting-edge processors for commercial, scientific, and military missions.

IMPRESSIVE HERITAGE:

We've been a new space company for more than 20 years and have delivered many thousands of cards. In that time, we've accumulated a LOT of experience that you get to benefit from when you partner with us.

As of March 2026, our cumulative time on orbit stands at more than 691 years. In that time, we have had no on-orbit product failures and have more than 340 boards in space.



COMPACT, EFFICIENT, FLEXIBLE:

Ideal for spacecraft, unmanned systems, and robotics requiring small size, low power, and adaptability.

CERTIFIED QUALITY:

AS9100 and ISO 9001:2015 certified; explore our FPGA-based multiprocessors, SoCs, and advanced subsystems.

ENHANCED COTS SOLUTIONS

Optimizes the cost & performance trade while still providing radiation robustness

OPEN ARCHITECTURE DESIGNS

Enables development across a variety of toolkits

SHORTER LEAD TIMES

Shipping 500+ processors annually

18th June, 2026