

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

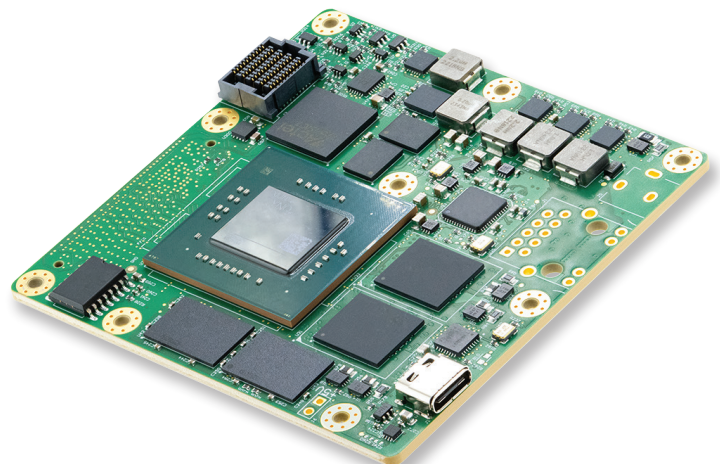
The Q8S, the Flight Model (FM) version of the Q8, has been flying since September 2020.



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
- 6 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 de-rated to -40 to +60 °C

INTERFACES

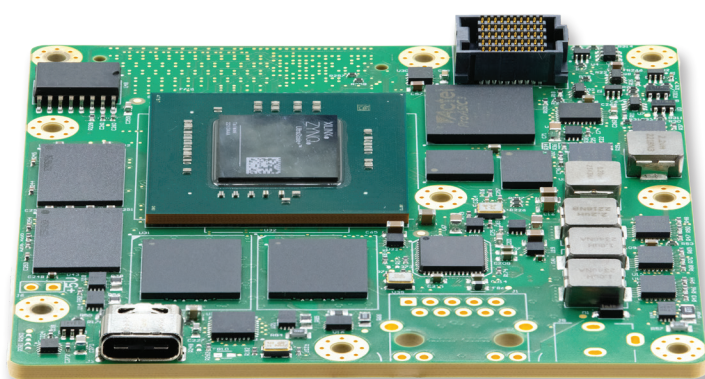
- Power
- Gigabit Ethernet (RJ45)
- 1x USB Type-C Host port (USB 2.0 & USB 3.1 Gen 1)
- CAN Bus controller (in logic)
- Up to 38 single-ended GPIO 3.3 V, 14 single-ended GPIO 1.8 V, 12 MIO 1.8 V, 64 LVDS pairs/128 single-ended GPIO 1.8 V, 3 Gigabit transceivers (SATA, PCI express), USB 2.0, and factory-selectable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

RADIATION ROBUSTNESS FEATURES

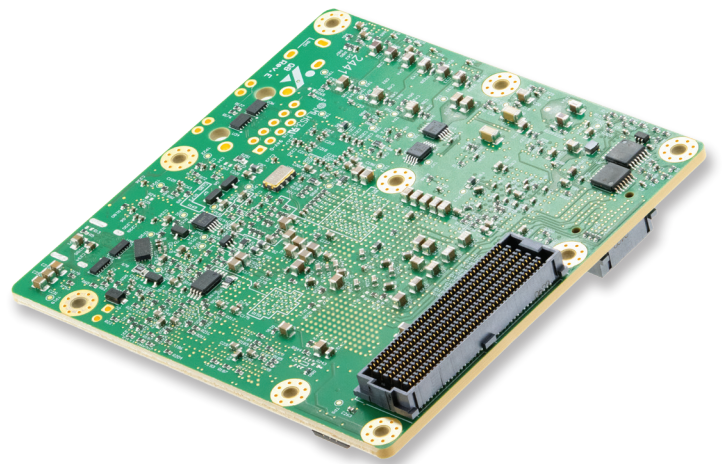
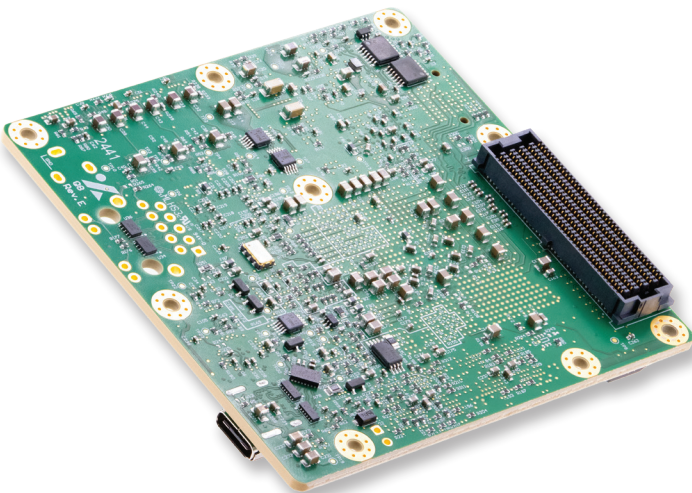
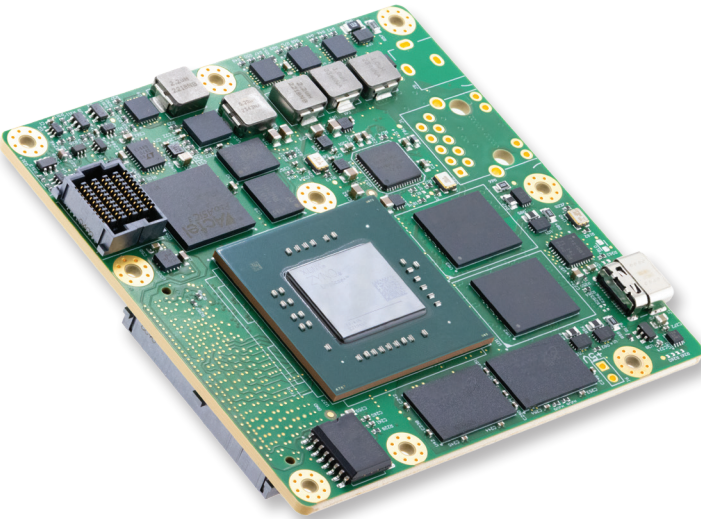
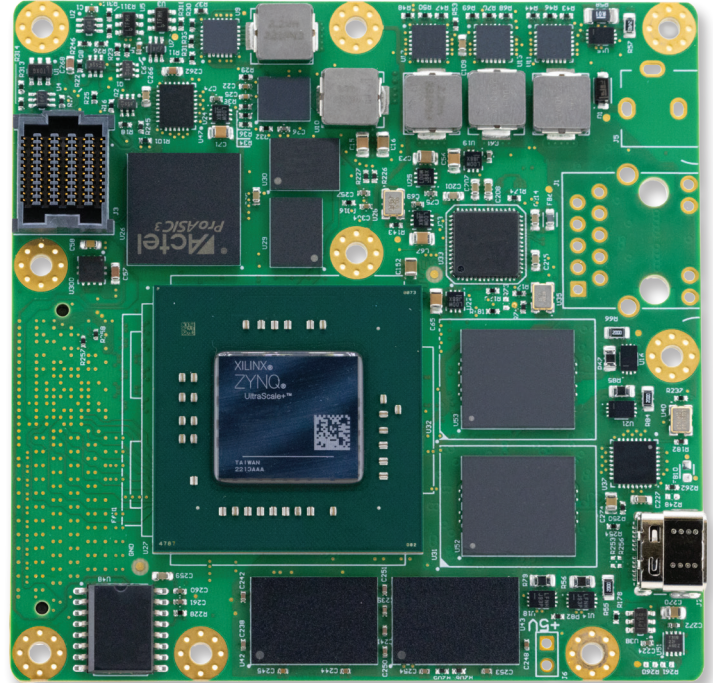
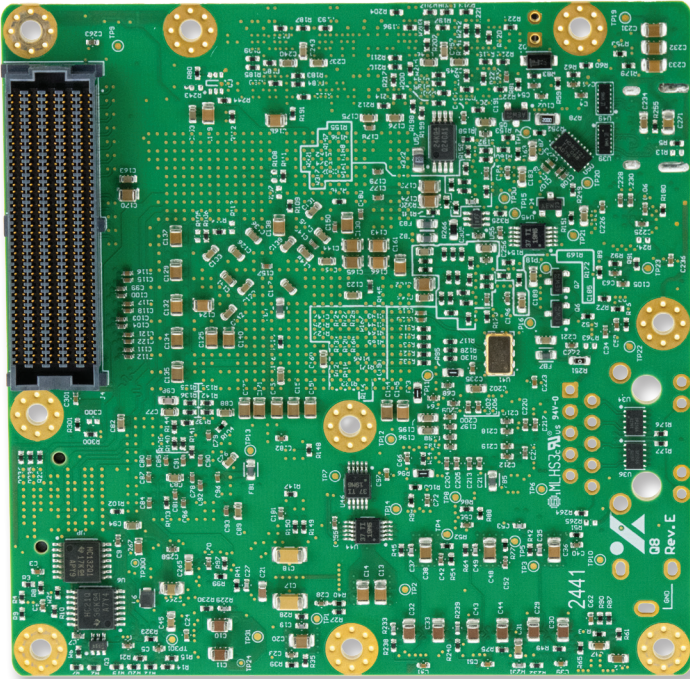
- Triple mode redundancy in Control FPGA
- EDAC-protected RAM
- Upset and multi-current monitoring
- Overcurrent protection (multiple)
- FPGA bit stream scrubbing
- Software robustness/ watchdog

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



PHYSICAL VIEWS



ORDERING INFORMATION

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



Q8-001

- Baseline configuration, available in flight and engineering model configurations.

Q8-002

- This configuration is often used as a bench top model as it has an integrated 1G Ethernet RJ45 and power barrel. It 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.

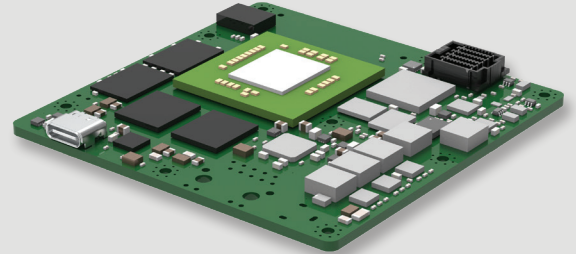
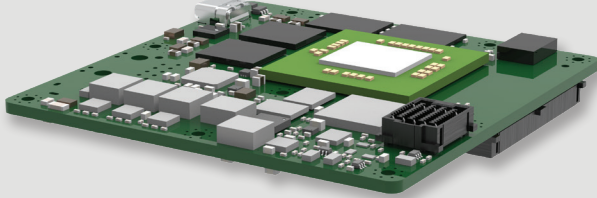
Configuration	Q8-001	Q8-002	Q8-003	Q8-004
EM Uncoated Part Numbers	XS002-10002-001-02-A	XS002-10002-002-02-A	XS002-10002-003-02-A	XS002-10002-004-02-A
FM Uncoated Part Numbers	XS002-10001-005-02-A	N/A	XS002-10001-012-02-A	XS002-10001-013-02-A
FM Conformal Coated Part Numbers	XS002-10001-001-02-A	N/A	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 PCB USB connector			Q8 bottom mezzanine connector underside to connect to custom daughterboard
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)			

CONFIGURATIONS

Each of the standard configurations are detailed below and are available as EM, FM uncoated, or FM conformally coated versions.

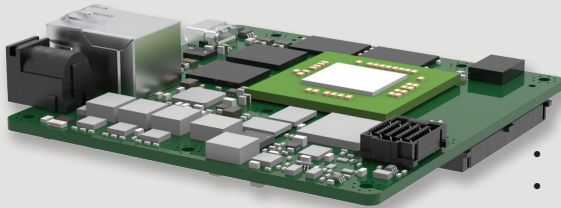
Q8-001

Baseline configuration.

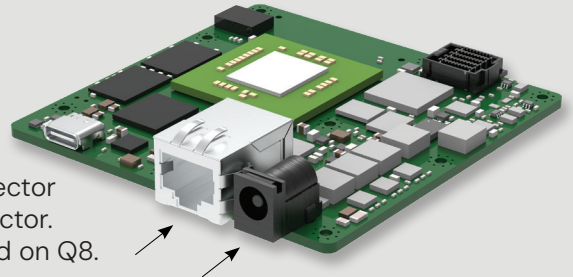


Q8-002

Benchtop model.

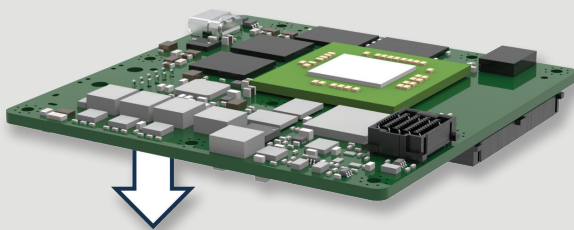


- External power connector
- RJ45 Ethernet connector. Ethernet PHY installed on Q8.

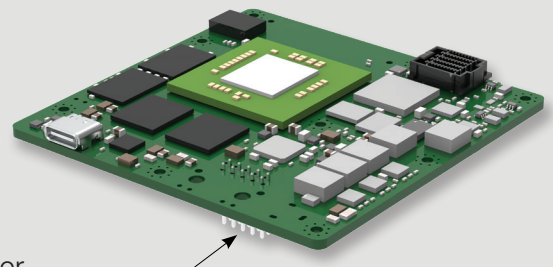


Q8-003

Similar to Q8-001 but with changes detailed below.

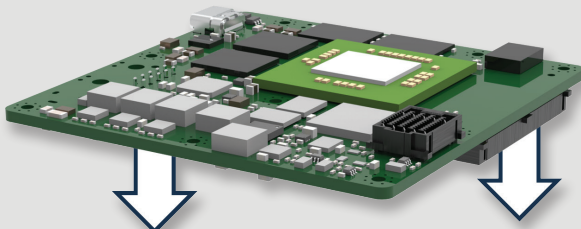


- Ethernet PHY installed on Q8, signals routed down through connector header to customer daughter board providing Ethernet magnetics



Q8-004

Similar to Q8-003 but with addition detailed below.

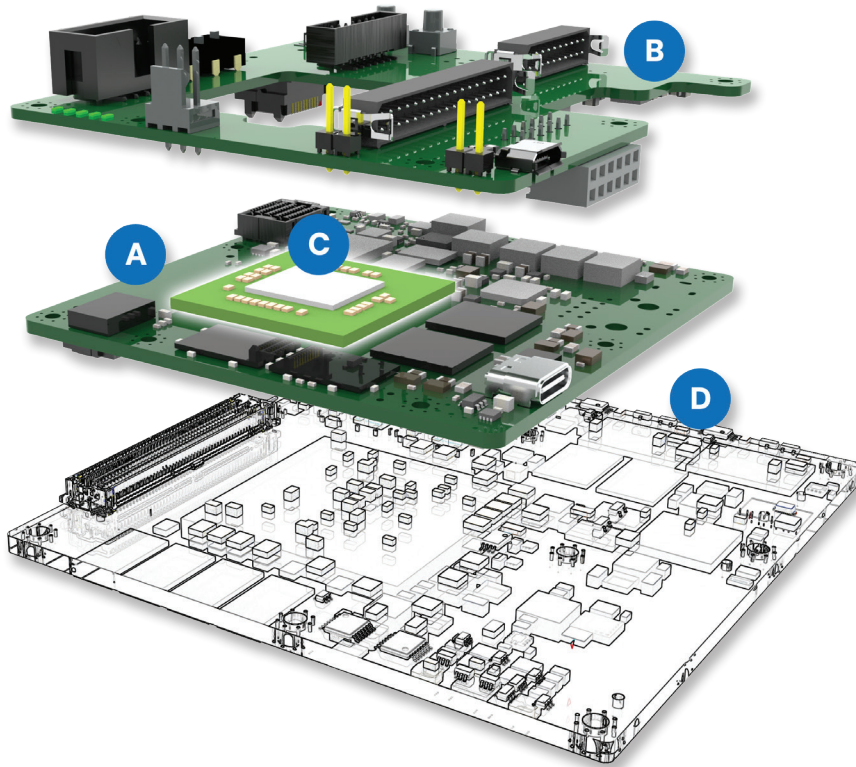


- USB2 signals rerouted from topside USB connector to mezzanine connector for customer daughter board use; USB2 oscillator always enabled.
- Ethernet PHY installed on Q8, signals routed down through connector header to customer daughter board providing Ethernet magnetics

DEVELOPING WITH XIPHOS

It's All Included.

Xiphos delivers flight-ready processor hardware as a complete, open development platform: Linux boots out of the box, baseline FPGA logic is already configured, the PIM and cables provide immediate console/ network/ JTAG access, and customers retain low-level flexibility instead of being locked into a closed or bare-metal environment. More specifically:



1. Ready to Use Out of the Box

Xiphos products (A) are designed to accelerate development from the moment they are powered on. Rather than requiring customers to perform extensive low-level hardware bring-up, each processor boots directly into Linux and provides immediate access to a command-line interface. Developers can begin building and testing their applications right away, reducing integration effort and shortening time to productivity.

2. The PIM is Included as Part of Every Board Package

The Product Integration Module (PIM) (B) gives customers everything they need to begin development immediately. It provides convenient access to console, networking, JTAG, power, test, and other key interfaces in a lab-friendly format. These capabilities are included as part of the platform, not as an add-on, allowing teams to focus on development instead of building their own integration infrastructure.

3. Open Platform. Unlimited Flexibility.

Xiphos products are designed to grow with your application. Out of the box, they include baseline FPGA logic (C) and Linux drivers that initialize the processor board and PIM interfaces, as well as any Xiphos daughter board, while supporting the Linux development environment. For advanced users, the reference design and Vivado skeleton project serves as a proven foundation for developing custom FPGA logic and software and integrating mission-specific daughter cards (D), providing maximum flexibility without sacrificing ease of use.

4. Supports Both Software-First and Hardware Integration Workflows

Whether your priority is software or hardware, Xiphos products provide the right starting point. Software teams can begin developing immediately with the out-of-the-box Linux environment, while hardware teams can use the PIM and daughter-board architecture to implement custom I/O, FPGA logic, and mission-specific functionality. The PIM exposes the essential interfaces needed for early development, and the daughter board provides the flexibility for full system integration. **Start simple. Scale to a fully customized solution.**

5. And There's More...

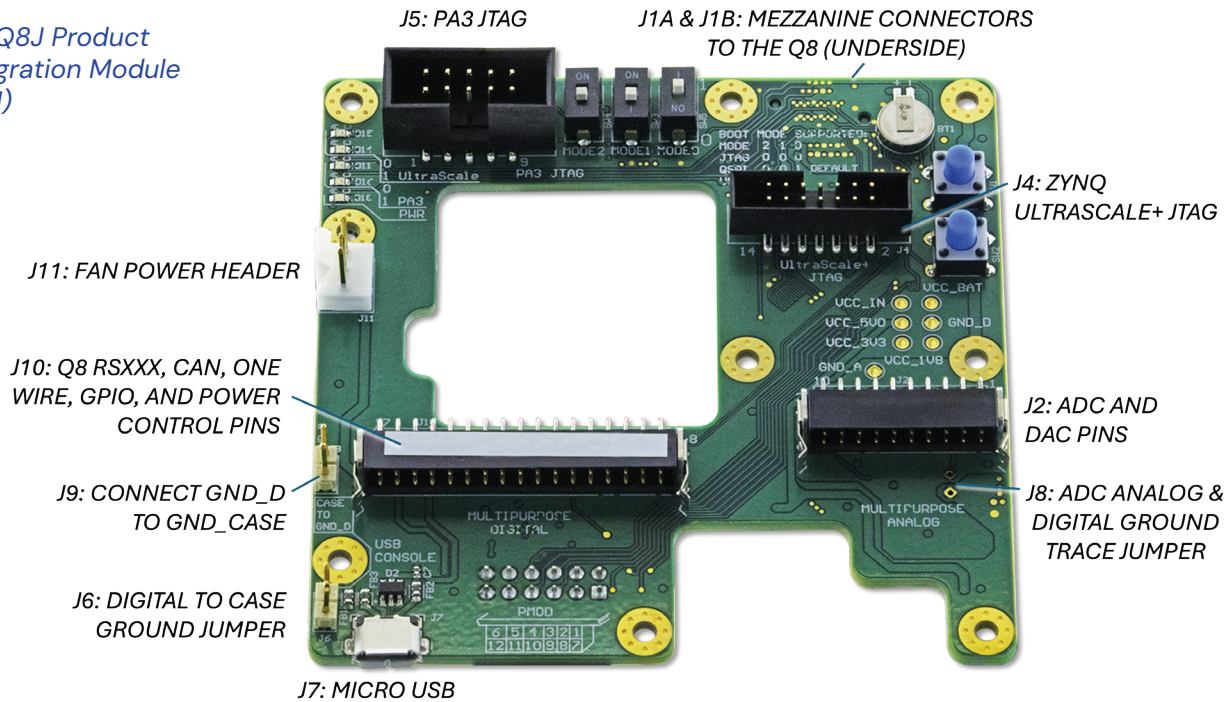
Xiphos delivers a complete development ecosystem, not just a processor board. Customers receive access to a dedicated support portal with direct Engineering support, a comprehensive Wiki containing 3D models, user manuals, ICDs, and other technical resources, and an SDK that is available as soon as an order is placed – before the hardware even ships. Built on a Yocto Linux Board Support Package (BSP) using a Long-Term Support (LTS) distribution, Xiphos platforms provide a robust and stable software foundation from day one, enabling teams to develop faster and integrate with confidence.

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:

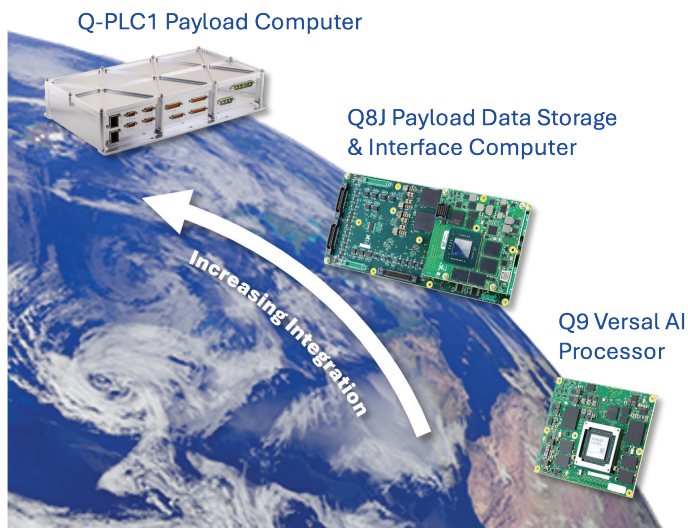
Products offer impressive processing, networking, RF and storage performance by leveraging state-of-the-art commercial devices.

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.



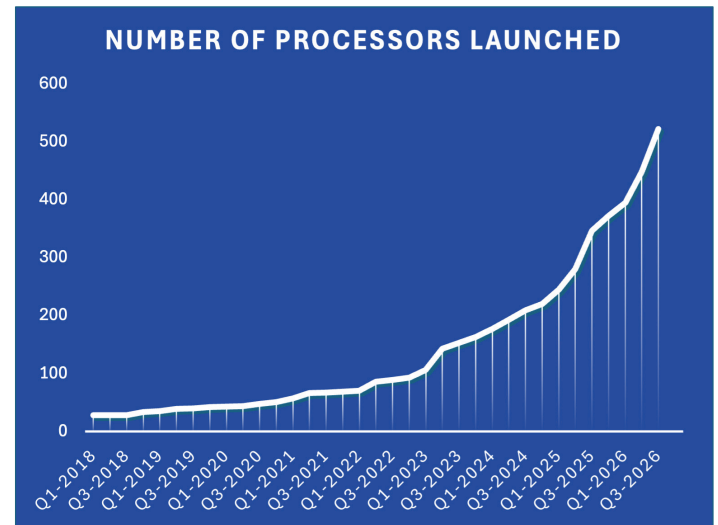
ABOUT XIPHOS

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 August 2026, our cumulative Q-Card time on orbit stands at more than 750 years.



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

13th August, 2026