Q8 OBC (On-Board Computer)

FEATURE HIGHLIGHTS

MODERN PERFORMANCE AND SPACE-PROVEN RELIABILITY

The On-Board Computer (OBC) is a TRL9 product built around the Q8 processor board, which has hundreds of years of flight heritage across over 100 missions. iphos' space-hardened COTS architecture has a record of no on-orbit board failures and low upset rates, as required for the core of your spacecraft. The AMD/ Xilinx UltraScale+ MPSoC processor provides significant processing power, efficiency, and flexibility to meet the needs of your most demanding missions.

SPACECRAFT SUBSYSTEM CONTROL

The OBC offers a large selection of serial interfaces for all spacecraft subsystems, with options including RS-422/485, CAN, and LVDS-based protocols for ACS sensors and actuators, communications, propulsion, and EPS/thermal.

Gigabit Ethernet and USB 2.0 provide additional flexibility to support payload interfaces.

SPACECRAFT MONITORING

To monitor subsystems, the Q8 OBC provides -5V to +5V and 0V to 5V analog inputs, as well as PT2000 thermistor inputs for thermal monitoring.

FLEXIBILITY FOR YOUR MISSION

Your OBC should enable your spacecraft platform design, not limit it. The Xiphos toolchain gives you full control over the FPGA fabric and Linux Operating System environment.

Its reconfigurable 3v3 GPIO and LVDS pins allow for custom interfaces, while flexible RS-422/485 serial settings make it easy to adapt to your hardware suite.

APPLICATIONS

The flexibility of the Q8 OBC, along with its modest SWaP requirements, make it ideally suited for MicroSat and SmallSat buses.

- Extensive 1/0, processing, and storage resources for bus Sufficient payload resources without separate interface box 30krad TID for long-duration missions
- Low upset rate of the Xilinx UltraScale+

ROBUSTNESS FEATURES FOR YOUR SPACECRAFT

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

SOFTWARE DEVELOPMENT

To support software development on Linux workstations, Xiphos provides an Application Development Kit, with standard Linux libraries for CIC++. If you've previously developed code for Linux desktop and server applications, you can easily port it to the OBC. Access OBC hardware and logic interfaces through 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 On-Board Computer (OBC) is a TRL9 product built around the Q8 processor board, which has hundreds of years of flight heritage across over 100 missions.

Other flight heritage products in the current Xiphos Q-Card family include the Q7, Q8, and Q8J.

Xiphos has been flying Q-Cards since 2002.

CHARACTERISTICS

COMMUNICATION INTERFACES

- 1x GigE (1Gbps) port with magnetics
- 2x USB 2.0
- 2x CAN bus (2.0B)
- 2x UART over CAN [PHY]
- 18x RS422/485/232 ports
- 2x RS422/485/232 ports [Full Duplex only]
- 7x RS422 OUT ports
- 1x RS422/485/232 Remote Diagnostic Port (RDP)
- 1x Power cycle request input

CONFIGURABLE INTERFACES

- 6x LVDS outputs
- 6x LVDS inputs
- 10x 3.3 V outputs
- 10x 3.3 V inputs

ANALOG INTERFACES

- 9x Analog inputs (0 to 5 V, 10 mV accuracy)
- 3x Analog inputs (-5 to 5 V, 20 mV accuracy)

TEMPERATURE INTERFACES

- 48x PT2000 Temperature sensors Inputs

FORM FACTOR

- 167.3 mm x 182.6 mm x 91 mm
- 957 g

ENVIRONMENTAL

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

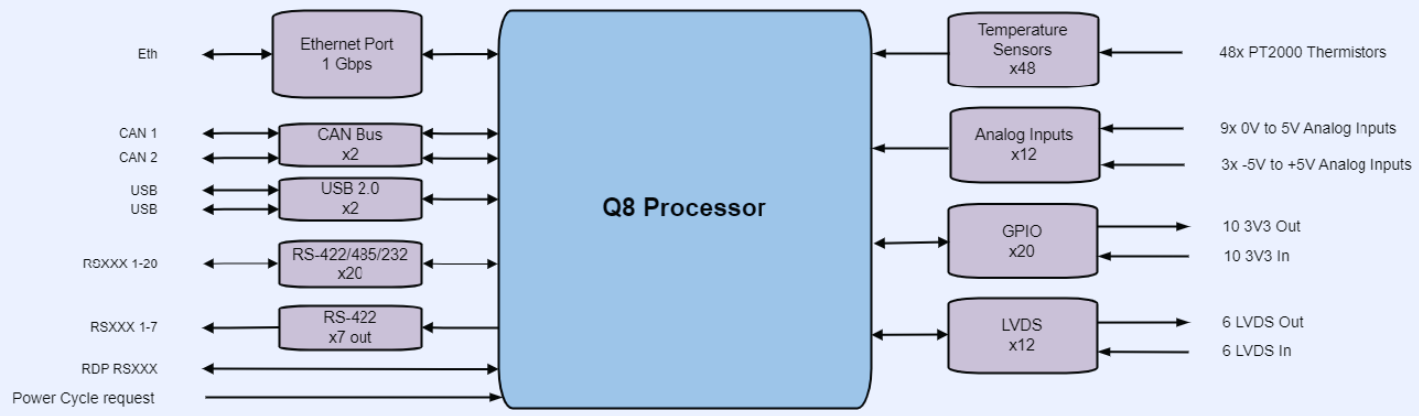
POWER CONNECTOR

- J9 Micro-D 9 Socket
- Input voltage: 9 V
- 7.5 W nominal and 14 W peak

I/O CONNECTORS

- J1 Micro-D 51 pins - 24x PT2000 inputs
- J2 Micro-D 51 pins - 24x PT2000 inputs
- J3 Micro-D 51 pins - 8x RSXXX ports
  1x RSXXX Remote Diagnostic Port (RDP)
- J4 Micro-D 51 pins - 10x RSXXX ports
- J5 Micro-D 37 pins - 20x 3V3 GPIO (10 + 10)
  2x RS422 [Full Duplex only]
  1x Power cycle request input
- J6 Micro-D 37 pins - 12x Analog inputs
  6x RS422 out
- J7 Micro-D 51 pins - 12x LVDS pairs
- J8 Micro-D 31 pins - 2x CAN bus
  2x UART over CAN PHY
  1x Ethernet
  2x USB ports

BLOCK DIAGRAM



MECHANICAL VIEWS

Includes 10x M4 mounting holes

J7: Micro-D 51 pins
- 12x LVDS pairs

J8: Micro-D 31 pins
- 2x CAN bus
- 2x UART over CAN PHY
- 1x Ethernet
- 2x USB ports

J5: Micro-D 37 pins
- 20x 3v3 GPIO (10 + 10)
- 2x RS422 (Full duplex only)
- 1x Power cycle request input

J4: Micro-D 51 pins
- 10x RSXXX ports

J6: Micro-D 37 pins
- 12x Analog inputs
- 6x RS422 outputs

J3: Micro-D 51 pins
- 8x RSXXX ports
- 1x RSXXX Remote diagnostics port (RDP)

J1: Micro-D 51 pins
- 24x PT2000 inputs

J2: Micro-D 51 pins
- 24x PT2000 inputs

J9: Micro-D 9 pins
- 9 V power input

WHY CHOOSE XIPHOS?

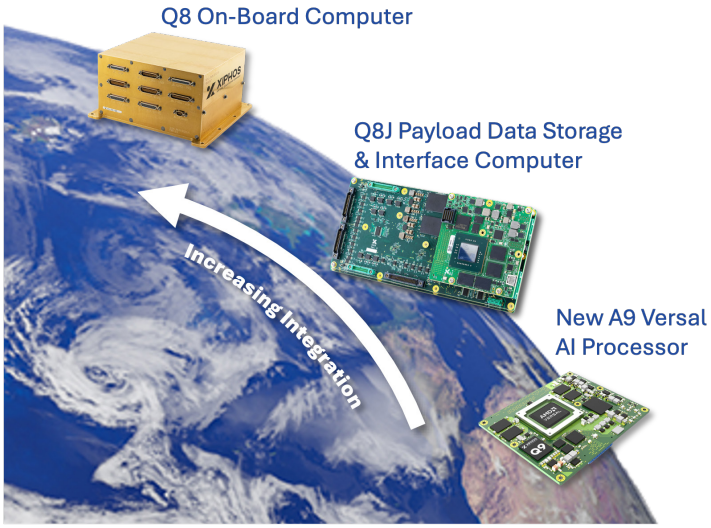
Faster Time to Launch Using COTS Processing With Heritage

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.

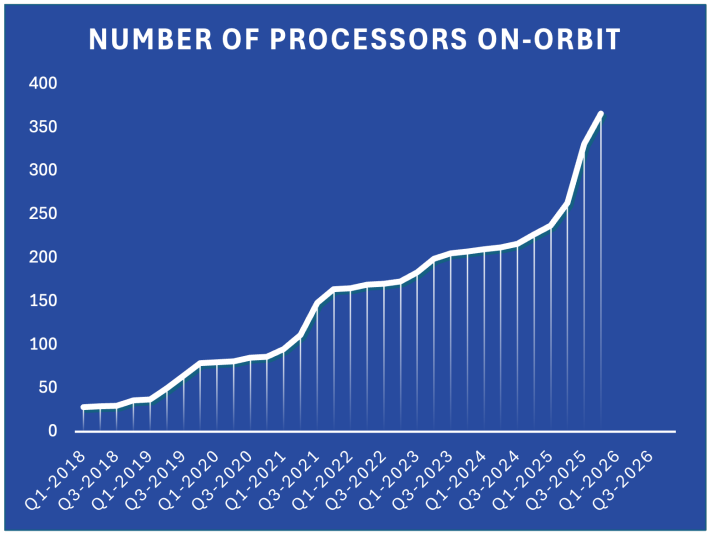
COST-EFFECTIVE PERFORMANCE:
Delivers high performance and reliability at a fraction of the cost of traditional space processors.

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



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

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.

21st May, 2025

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