Q8RF Family

XIPHOS
AN EPIQ SOLUTIONS COMPANY

Two Models of Powerful SDR/Processor Cards to Choose From

The Xiphos Q8RF family is based upon the well-regarded Zynq UltraScale+ RFSoCs (RF System-on-Chip) devices. These are highly integrated system-on-chip devices from AMD Xilinx that combine high-speed RF-class ADCs and DACs, programmable FPGA logic, and embedded ARM processors on a single chip. This architecture enables direct RF sampling and real-time digital signal processing without the need for external data converters or complex analog front ends. By tightly coupling processing and conversion resources, RFSoCs significantly reduce system size, weight, power, and latency—making them ideal for advanced RF applications that demand high channel density, wide bandwidth, and low-latency signal chain control.

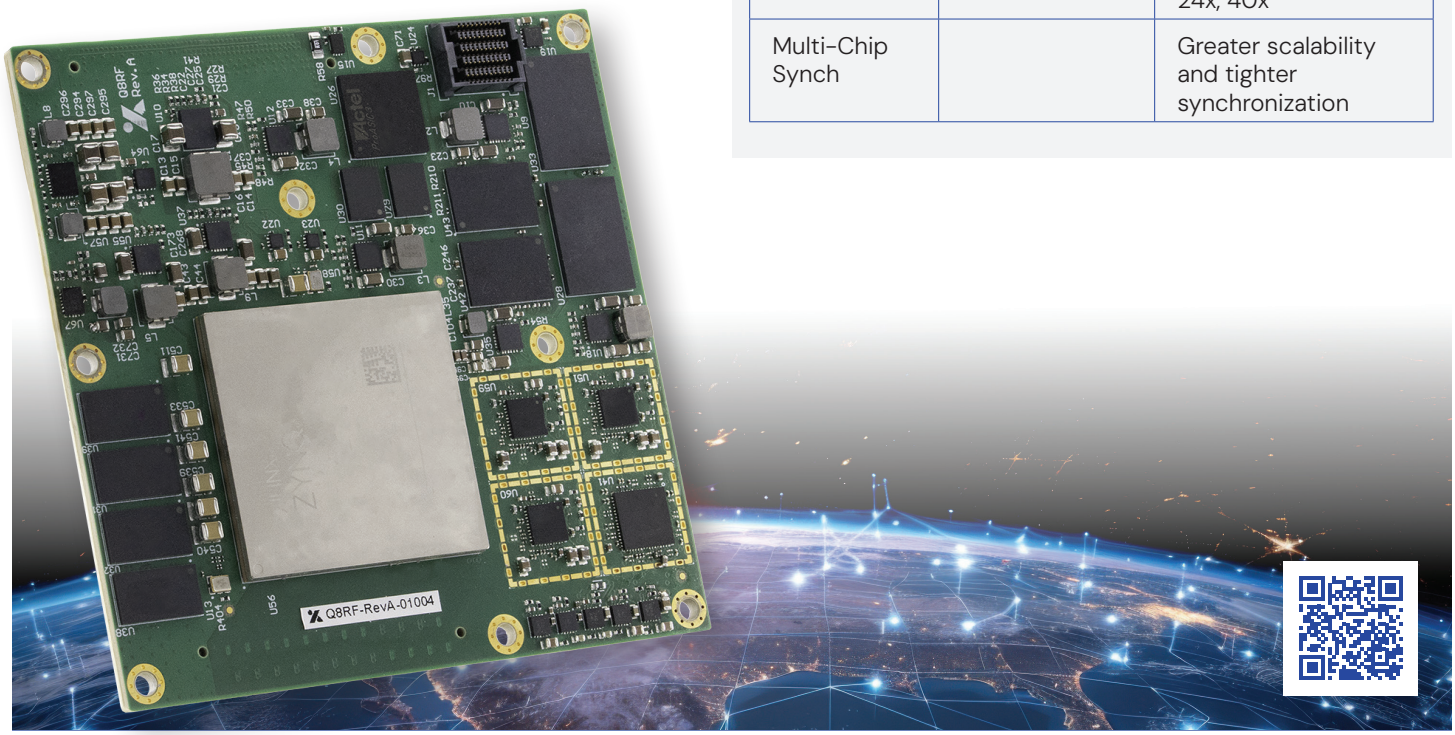
Xiphos has combined these RFSoC devices with its fault-tolerant space architecture that has been developed over more than two decades to ensure trouble-free operation in-orbit.

The new Q8RFG3 is based on the third generation of Xilinx RFSoC devices which adds upgrades to the digitization portion of the architecture, the RF input bandwidth and the ability to synchronize multiple Q8RFs together for applications such as digital beam forming.

COMPARING MODELS

The Q8RF and Q8RFG3 are based on different generations of AMD Xilinx RFSoC, providing two different price/performance points to choose from, depending upon the needs of the mission.

Model:	Q8RF	Q8RFG3
Storage	2x 32 GB NAND Flash	2x 128 GB eMMC
RFSoC Model	ZU28DR	ZU48DR
ADCs	8, each 4.096 GSPS max; 12-bit	8, each 5.0 GSPS max; 14-bit; Improved interleaving architecture and associated spurious
RF Input Frequency, max	4 GHz	6 GHz
DACs	8, each 6.5554 GSPS max; 14-bit	8, each 9.85 GSPS max; 14-bit
Decimation/ Interpolation	1x, 2x, 4x, 8x	1x, 2x, 3x, 4x, 5x, 6x, 8x, 10x, 12x, 16x, 20x, 24x, 40x
Multi-Chip Synch		Greater scalability and tighter synchronization



FEATURE HIGHLIGHTS

INDUSTRY-LEADING PERFORMANCE

The Q8RF family extends the capability of Xiphos' Q-Card line with an embedded multi-channel RFSoC (RF System On Chip). Like other Q-Cards, it provides a heterogeneous compute architecture including a full ARM processing subsystem and extensive FPGA fabric. It adds complete analog/digital programmability across the RF signal chain.

LOW MASS, VOLUME, POWER

Both Q8RF models measure 100 mm x 100 mm x 20 mm and consume as little as 20 W. Their small size, low mass and power consumption make them ideal for multi-channel RF applications that demand extremely high performance.

INTEGRATED HYBRID ENVIRONMENT

The Q8RF family provides a tight integration of RF ADC and DACs, a quad core ARM Cortex A53 Application Processing Unit, a dual core ARM Cortex R5 Real Time Processing Unit, and massive programmable logic resources for application-specific use.

PRODUCT INTEGRATION MODULE (PIM)

Each Q8RF is delivered with a detachable PIM to facilitate development. The PIM provides standard commercial interfaces (e.g. JTAG, USB), 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 Q8RF family. Q8RF 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.

FLEXIBLE INTERFACING

The Q8RF family provides 8x RF ADCs and 8x DACs, external Ref Clock(s) Inputs, and a Ref Clock Output through its RF mezzanine connector.

They also provide multiple digital I/O lines, including 1.8V/3.3V GPIO, LVDS, 28.21 Gbps GTY transceivers supporting PCIe Gen 3 & 100G Ethernet, and GTR transceivers supporting PCIe Gen 2 & SATA through digital mezzanine connectors.

APPLICATIONS

The extremely high performance and extensive FPGA fabric and RF ADCs/DACs make the Q8RF family ideally suited for applications such as:

- Multi-band advanced Software Defined Radios (SDR)
- Broadband Comms
- IoT
- Digital Beam-forming Networks
- Synthetic Aperture Radar (SAR)
- RF Monitoring & Signal Intelligence (SIGINT)

CHARACTERISTICS

Model:	Q8RF	Q8RFG3
Environmental Characteristics		
Temperature (operating)	Derated to -40 to +60 °C	
Size	100 mm x 100 mm x 20 mm	
Weight	200 g	
Power (typ.)	20-30 W @ 5-9 V	25-35 W @ 5-15 V
Memory		
Memory	• 4 GB PS LPDDR4 DRAM (with EDAC) • 4 GB PL DDR4 DRAM • 2x 256 MB QSPI Flash (NOR)	
Storage	2x 32 GB NAND Flash	2x 128 GB eMMC
RFSoC		
Model	ZU28DR	ZU48DR
Application Processing Unit	Quad-core ARM Cortex A53 Application Processing Unit at up to 1.2 GHz	
Real-Time Processing Unit	Dual-core ARM Cortex-R5 @ 500 MHz	
ADCs	8, each 4.096 GSPS max; 12-bit	8, each 5.0 GSPS max; 14-bit
RF Input Frequency, max	4 GHz	6 GHz
DACs	8, each 6.5554 GSPS max; 14-bit	8, each 9.85 GSPS max; 14-bit
Decimation/ Interpolation	1x, 2x, 4x, 8x	1x, 2x, 3x, 4x, 5x, 6x, 8x, 10x, 12x, 16x, 20x, 24x, 40x
System Logic Cells	930,000	
CLB Flip Flops	850,000	
CLB LUTs	425,000	
DSP Slices	4,272	

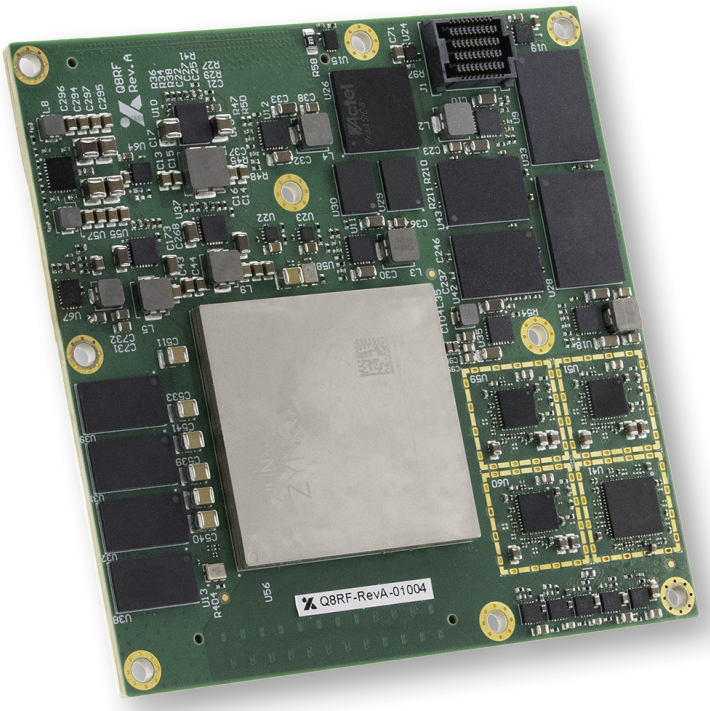
Model:	Q8RF	Q8RFG3
Control FPGA		
	Microchip ProASIC3	
Operating System		
	Yocto Linux BSP (LTS distribution)	
Bottom RF Mezzanine Connector		
	• 8x Transmit + 8x Receive RF • Ext Ref Clock(s) In, Ref Clock Out	
Bottom I/O Mezzanine Connector		
	• 46x LVDS or 92x 1.8V GPIO, 39x 3.3V GPIO • 16x 28.21 Gbps GTY transceivers supporting PCIe Gen 3 & 100G Ethernet • 3x GTR transceivers supporting PCIe Gen 2 & SATA	

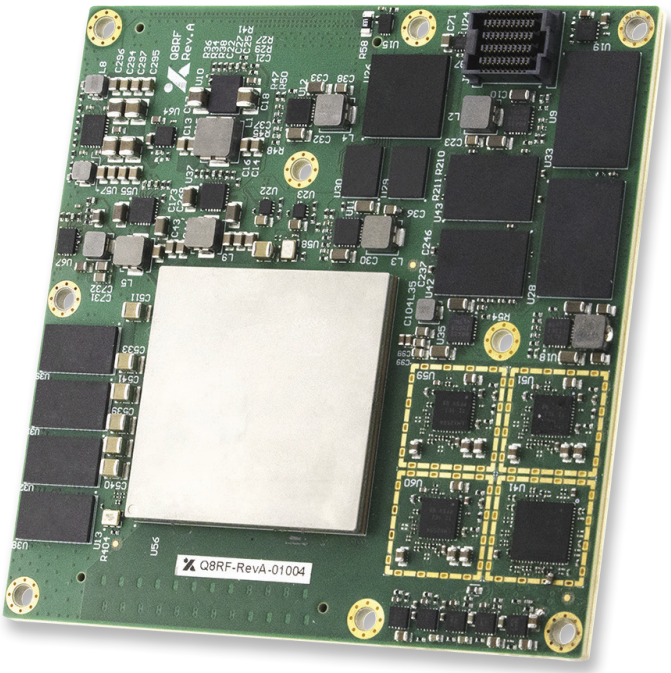
Q8RFS & Q8RFG3 FLIGHT MODELS INCLUDE

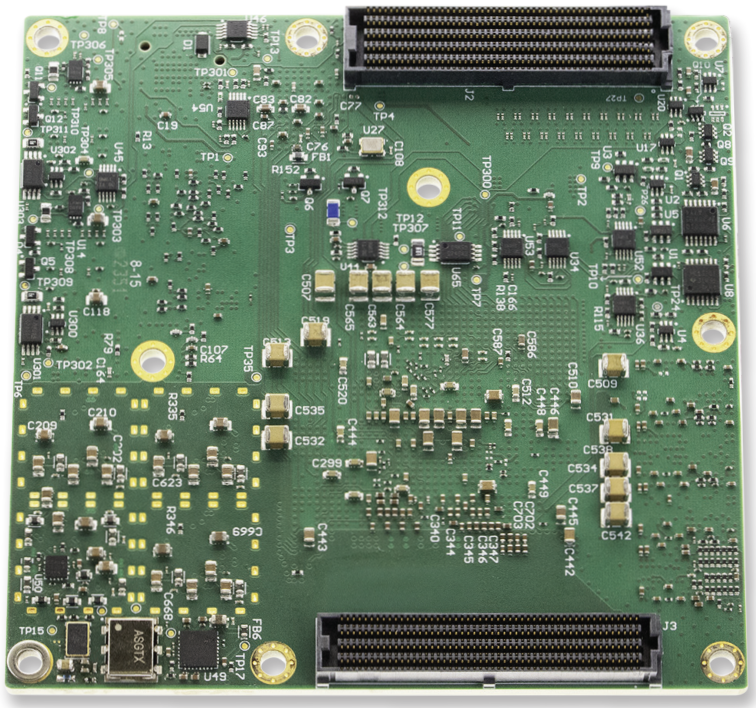
- Triple mode redundancy in Control FPGA
- EDAC-protected RAM
- Upset and multi-current monitoring
- Over-current protection (multiple)
- FPGA bit-stream scrubbing
- Software robustness / watchdog
- 30krad TID lifetime
- IPC Class 3 PCB and assembly workmanship

MECHANICAL VIEWS

Q8RF

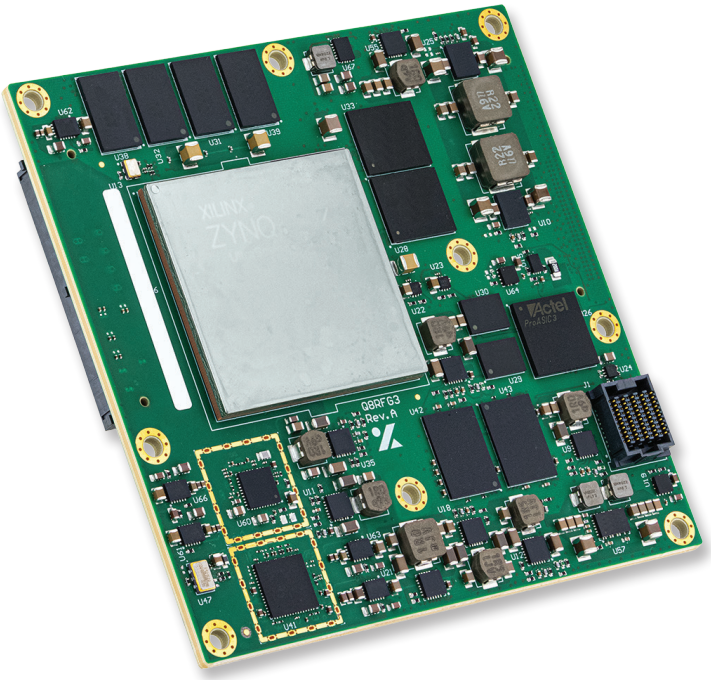


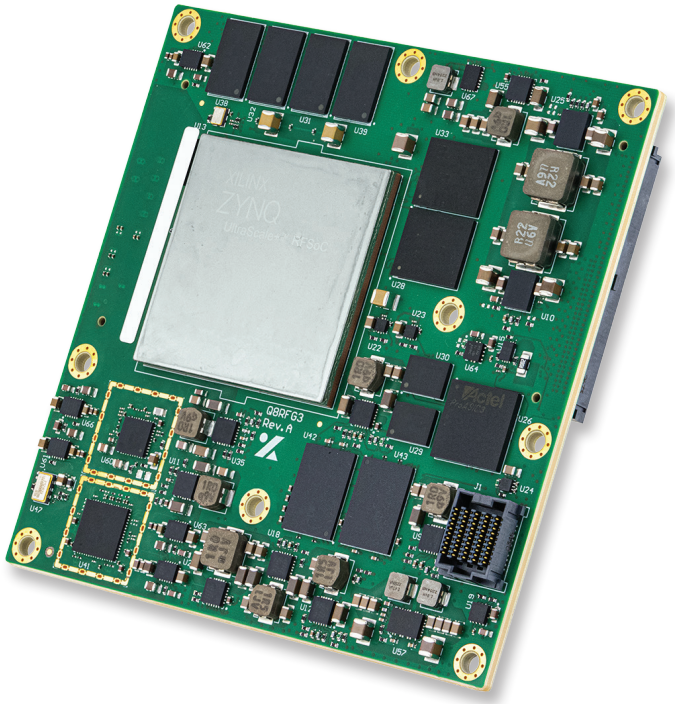


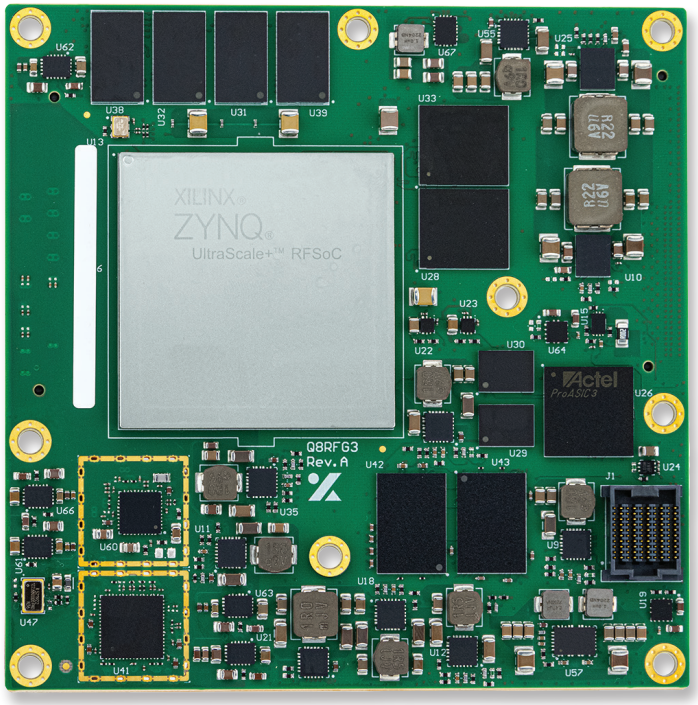


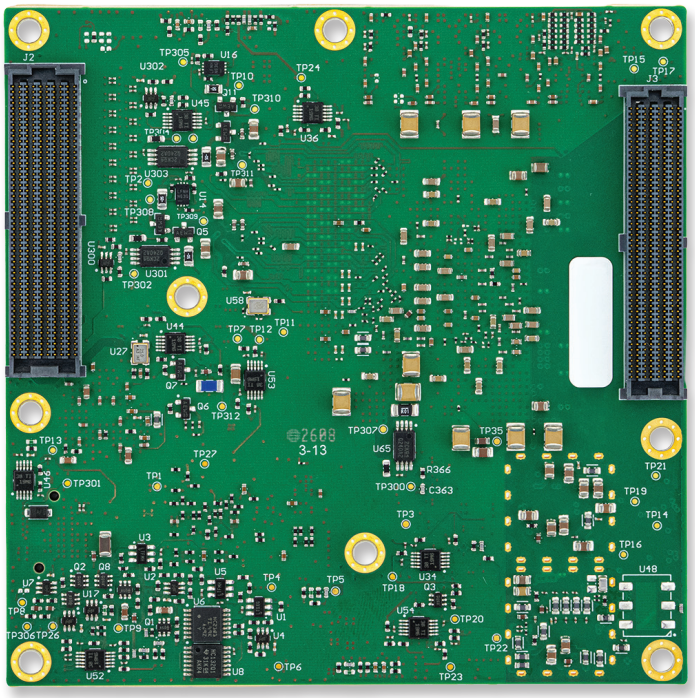
MECHANICAL VIEWS

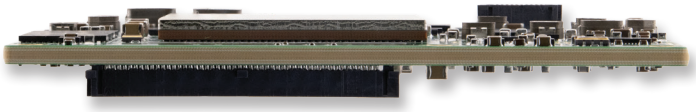
Q8RFG3







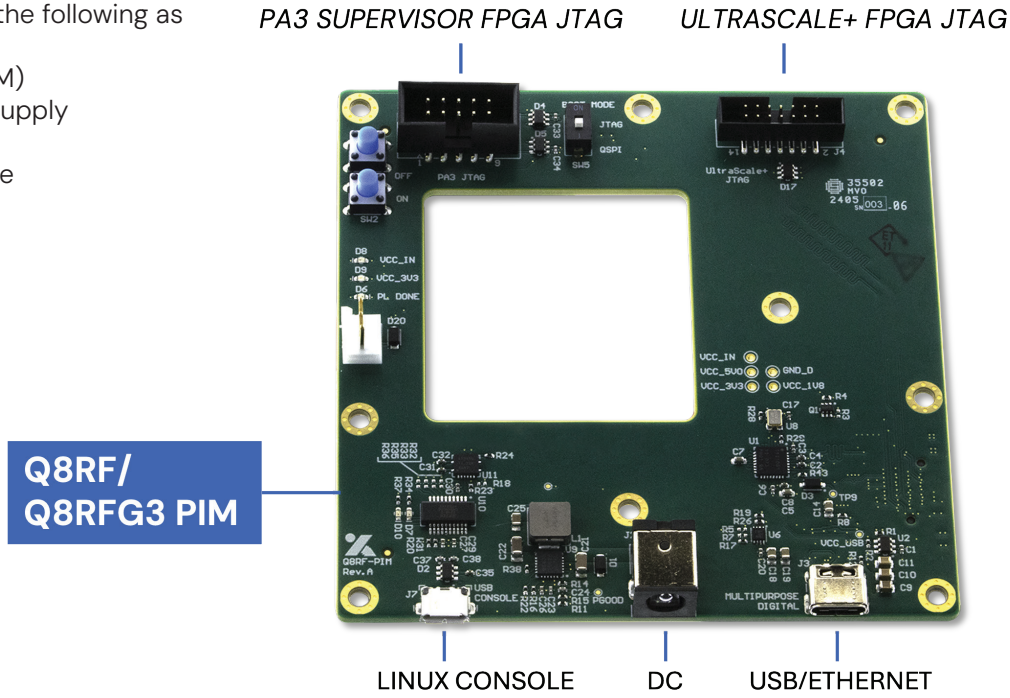




Q8RF INCLUDED ACCESSORIES

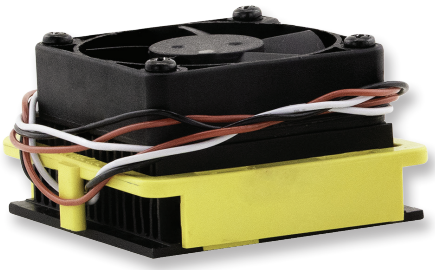
Q8RF and Q8RFG3 units ship with the following as standard:

- Product Integration Module (PIM)
- 12V output wall-mount power supply
- Fansink cooling assembly
- Ethernet Adapter to USB-A Male
- USB-C to female USB-A cable
- Male Micro USB



12V output wall-mount power supply

Ethernet Adapter to USB-A Male



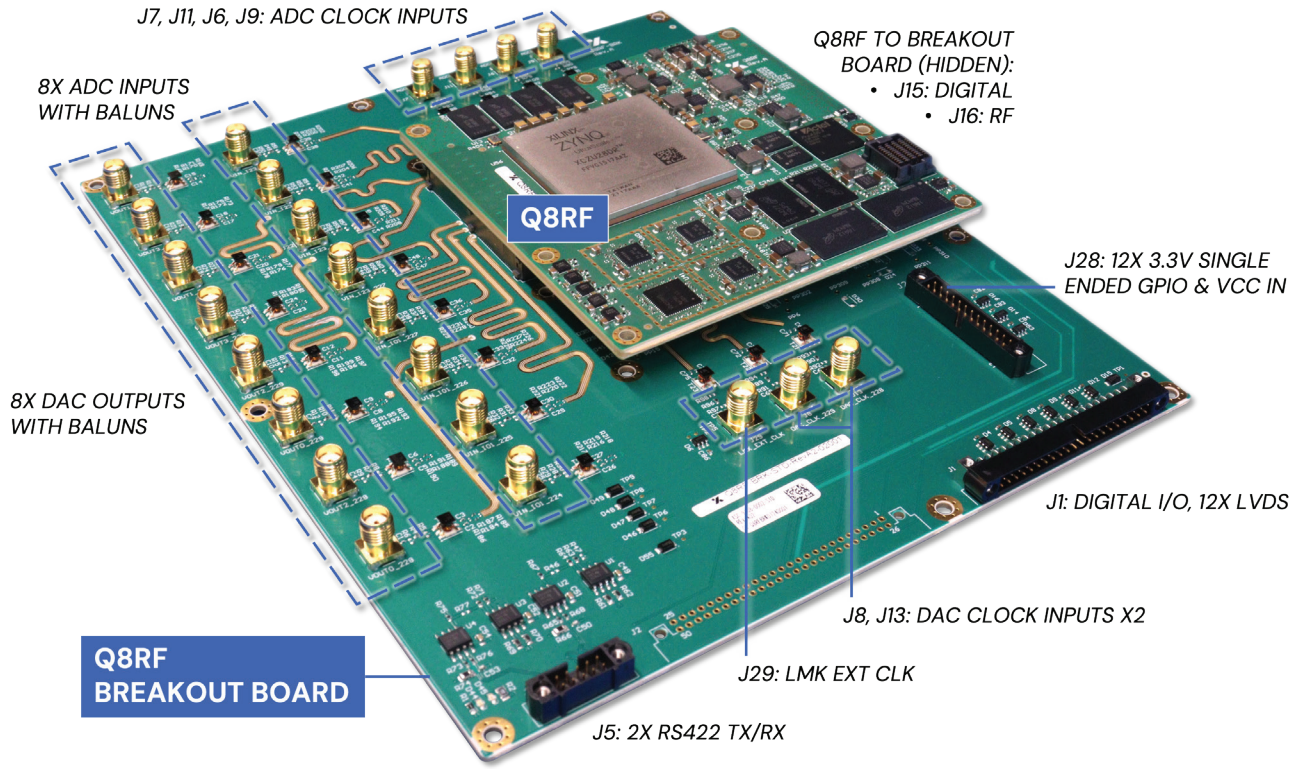
Fansink cooling assembly

USB-C to female USB-A cable

Male Micro USB

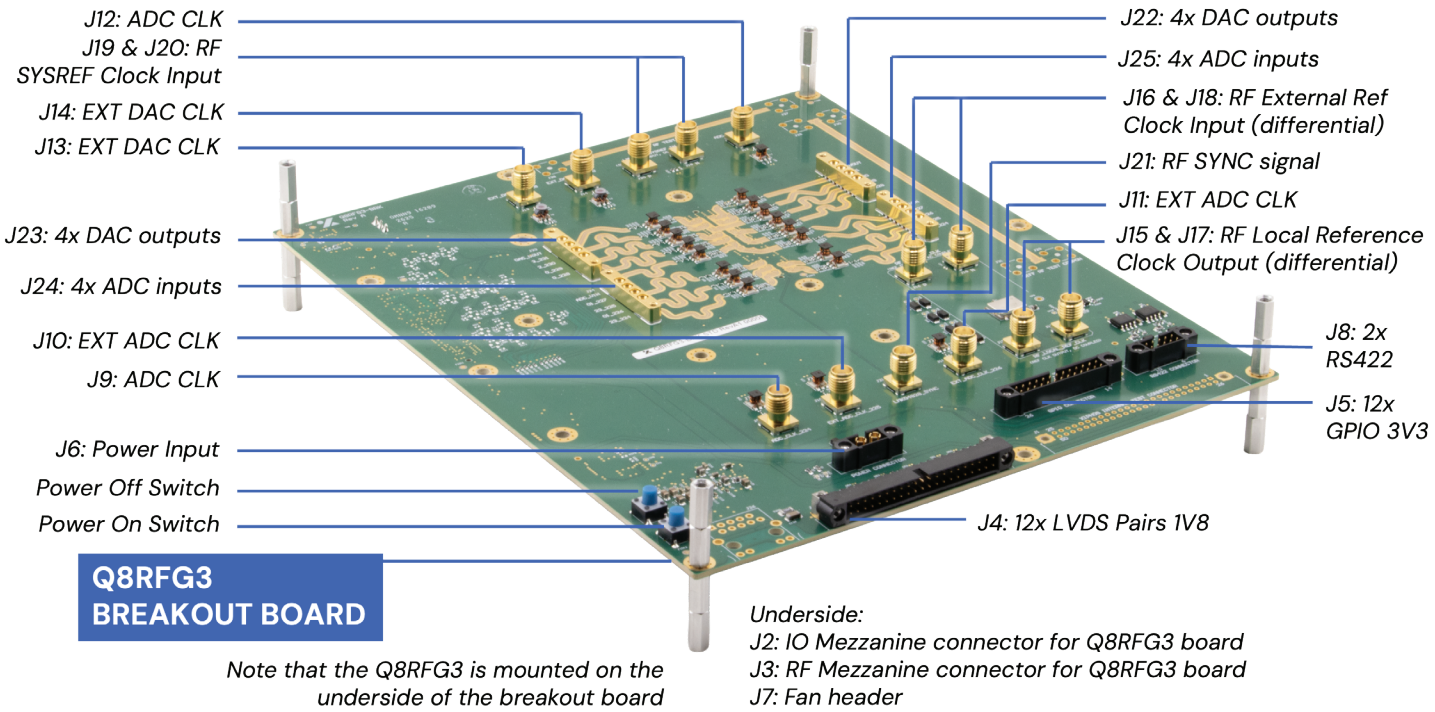
Q8RF OPTIONAL BREAKOUT BOARD

An optional breakout board is available to aid faster development, as shown below. Q8RF not included.



Q8RFG3 OPTIONAL BREAKOUT BOARD

An optional breakout board is available to aid faster development, as shown below. Q8RFG3 not included.



WHY CHOOSE XIPHOS?

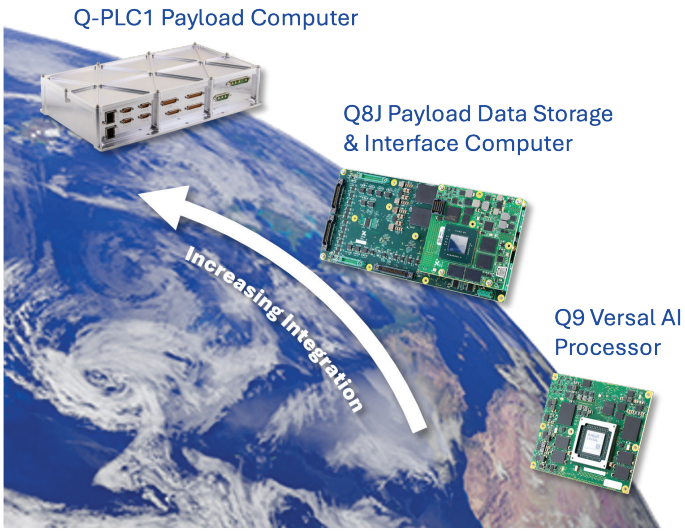
Faster Time to Launch Using COTS Processing With Heritage

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.

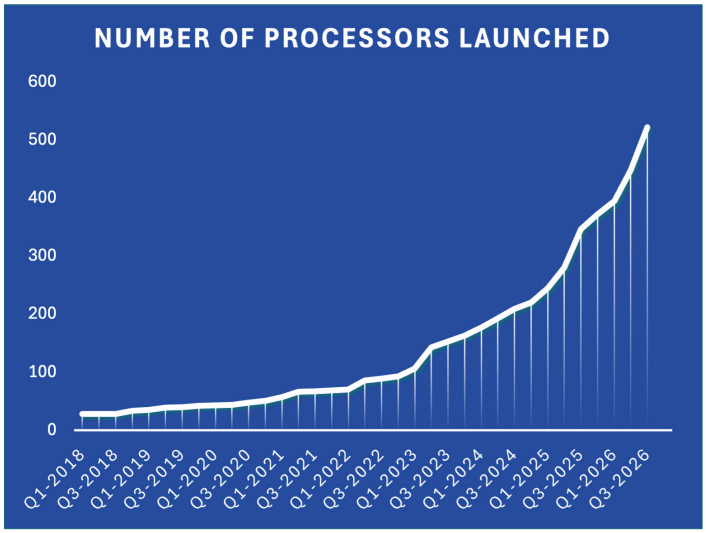


ABOUT XIPHOS

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

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