Q8J SPECIFICATIONS

XIPHOS
AN EPIQ SOLUTIONS COMPANY

FEATURE HIGHLIGHTS

INDUSTRY-LEADING PERFORMANCE

The Q8J 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 Q8J 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 Q8J ideal for aerospace applications that demand extremely high performance.

INTEGRATED HYBRID ENVIRONMENT

The application space in a Q8J is a tight integration of a quad core ARM Cortex A53 Application Processing Unit, a dual core ARM Cortex R5 Real Time Processing Unit, an ARM Mali 400 GPU 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.

OVERVIEW

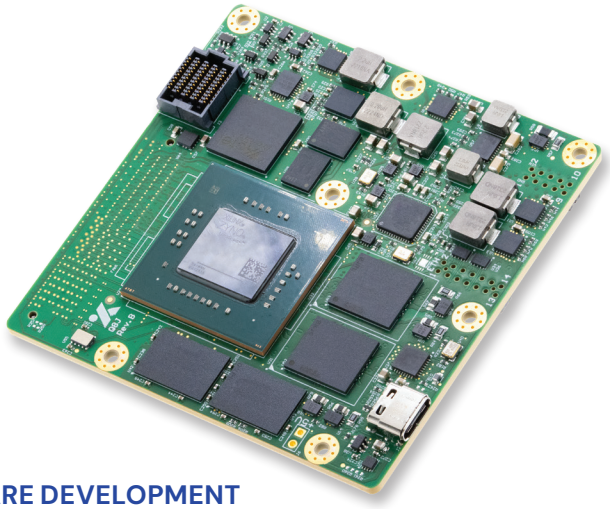
The Q8J extends the capability of the Xiphos Q8 processor, adding support for high-speed JESD204B interfaces and PCIe, as well as access to external DDR3 or DDR4 memory. The Q8J is ideal for advanced SDR applications, I/O-intensive payload processing, and high-speed C&DH systems. At the core of each Q8J is a hybrid environment of powerful multi-core CPUs and reprogrammable logic, providing flexible and scalable performance.

FLEXIBLE INTERFACING

The Q8J provides Gigabit Ethernet networking through its RJ45 connector along with a USB 2.0/USB 3.1 Gen 1 Host port. The Q8J also provides multiple digital I/O lines, including up to 76 single-ended GPIO, 12 MIO, 50 LVDS pairs/100 single-ended GPIO, 17 Gigabit transceivers (full duplex) +5 clock references, USB 2.0 and factory-selectable RS-232/422/485 through its mezzanine connector. The Gigabit transceivers can support JESD204B to interface with high speed ADCs, DACs and RF transceivers, as well as PCIe.

PRODUCT INTEGRATION MODULE (PIM)

Each Q8J 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.

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
- Mass memory applications
- Convolutional neural networks
- Advanced Software Defined Radios (SDR)

FLIGHT HERITAGE

The Q8JS, the Flight Model (FM) version of the Q8J, has been flying since September 2023:

Other flight heritage products in the current Xiphos Q-Card family include the Q7S and Q8S

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

CHARACTERISTICS

MEMORY

- 4 GB LPDDR4 DRAM
- 2x 256 MB QSPI Flash (NOR)
- 2x eMMC, 128 GB each, on independent buses / power control
- External PL-accessible DDR3 or DDR4 DRAM

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
- ARM Mali-400 GPU at up to600 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

- 6 W, typical
- 6 - 15 Vdc
- Various power modes (including deep sleep)
- Overcurrent detection & protection (global and local) and brownout protection and local) and brownout protection

FORM FACTOR

- 80 mm x 80 mm x 11.2 mm, 56 g (without connectors)

ENVIRONMENTAL

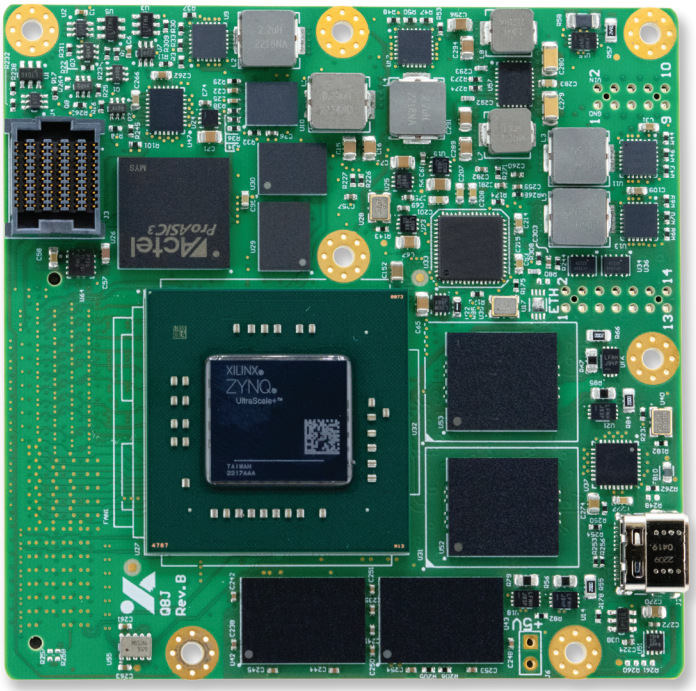
- Operating Temperature derated to -40 to +60 °C

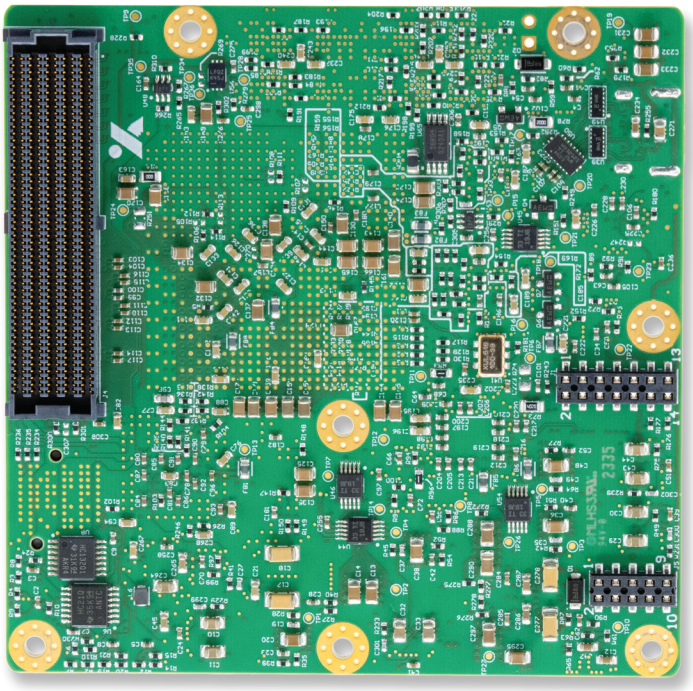
INTERFACES

- Power
- Gigabit Ethernet (RJ45 on adapter)
- 1x USB Type-C Host port (USB 2.0 & USB 3.1 Gen 1)
- CAN Bus & PCIe controllers (in logic)
- Up to 25 single-ended GPIO 3.3 V, 51 single-ended GPIO 1.8 V, 12 MIO 1.8 V, 50 LVDS pairs/ 100 single-ended GPIO 1.8 V, 16 PL GTH transceivers (up to 12.5 Gbps for JESD204B, PCIe) + 4 clock references, 1 PS GTR transceiver (up to 6 Gbps, for SATA, PCIe), USB 2.0, and factory selectable RS-232/422/485 (Mezzanine connector)

Q8JS FLIGHT MODEL INCLUDES

- 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
- IPC Class 3 PCB and Assembly Workmanship





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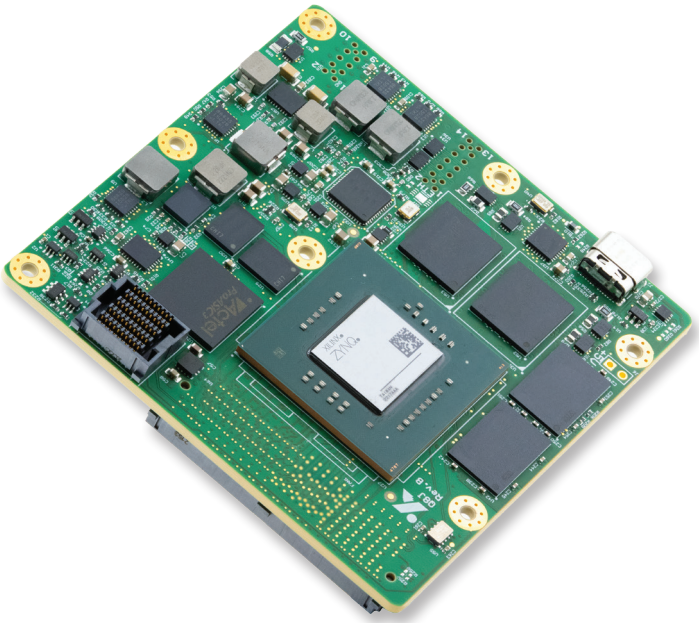
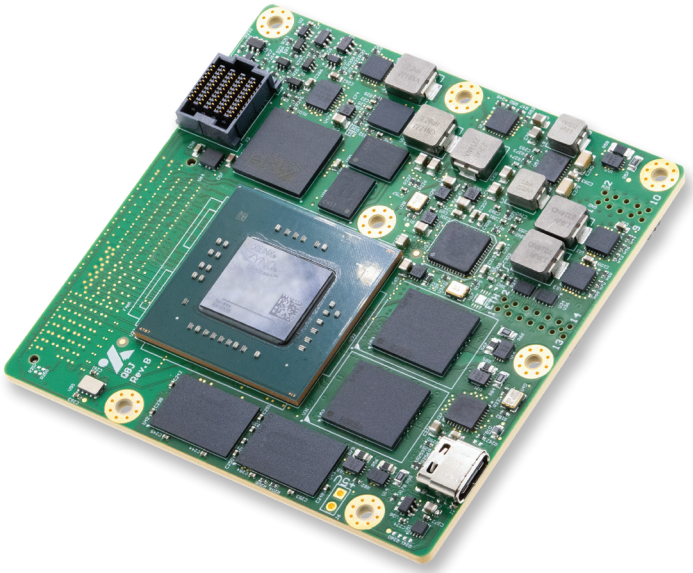
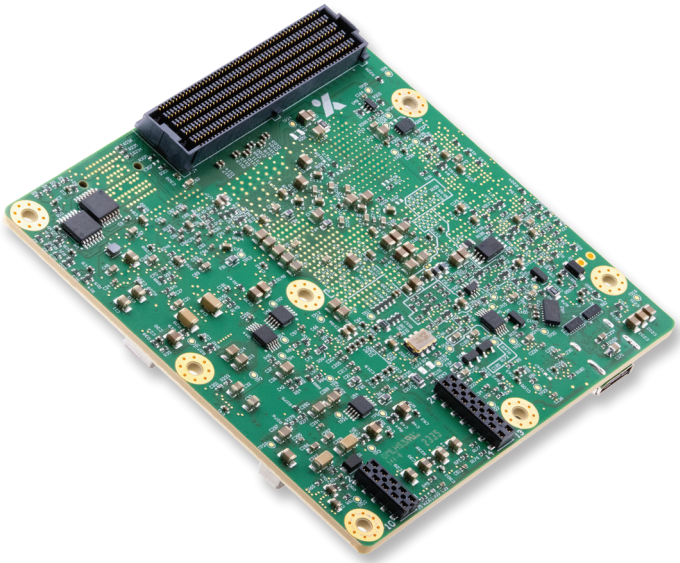
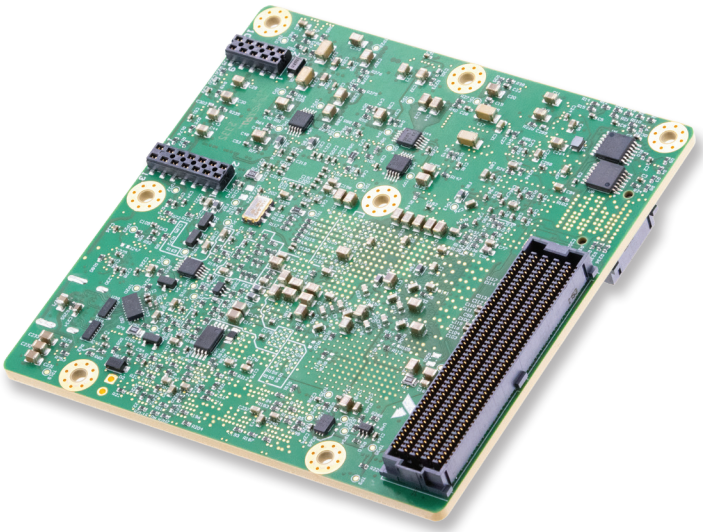
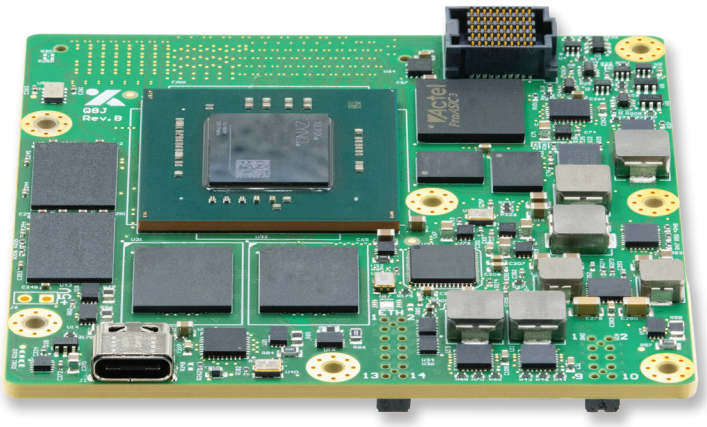






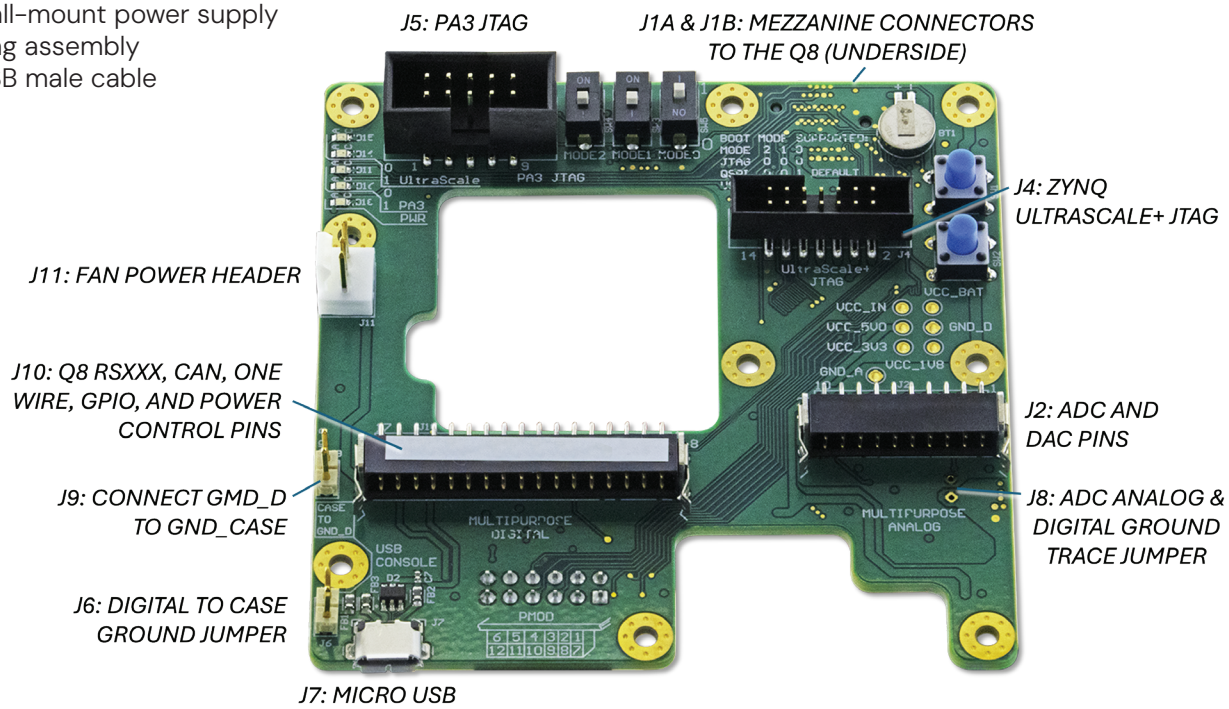




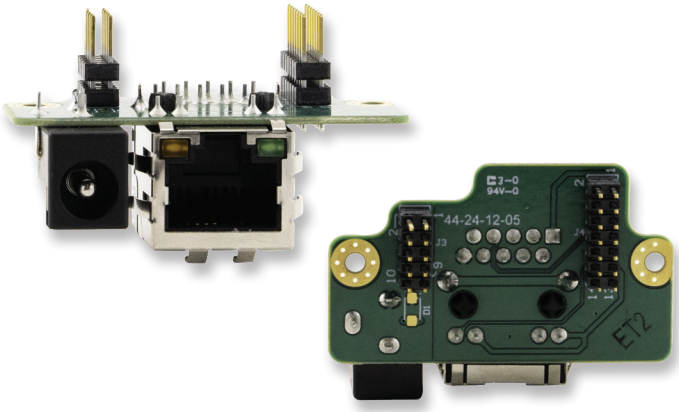
Q8J INCLUDED ACCESSORIES

Q8J units ship with the following as standard:

- Q8/Q8J Product Integration Module (PIM)
- 12V output wall-mount power supply
- Fansink cooling assembly
- Micro-B to USB male cable



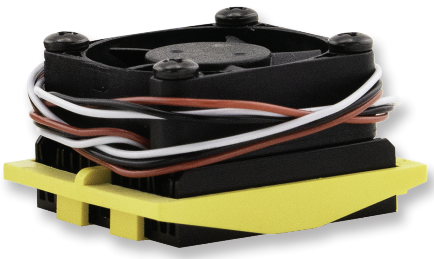
Q8/ Q8J Product Integration Module (PIM)



Ethernet Adapter Board for Q8J PCB (Two views)

12V output wall-mount power supply

Male Micro USB



Fansink cooling assembly

WHY CHOOSE XIPHOS?

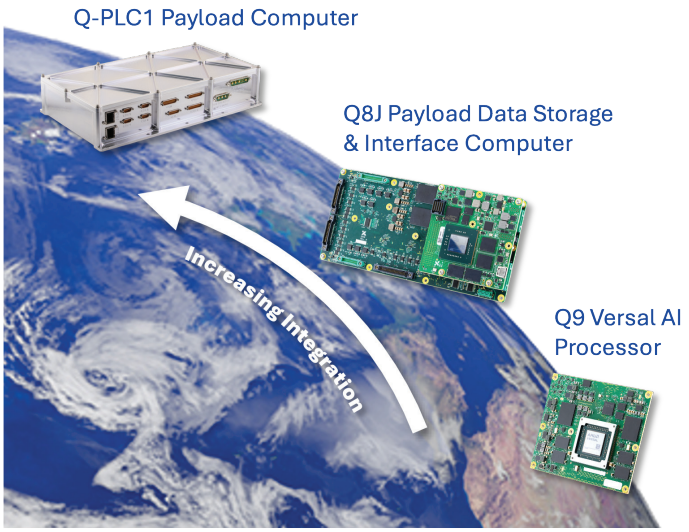
Faster Time to Launch Using COTS Processing With Heritage

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.

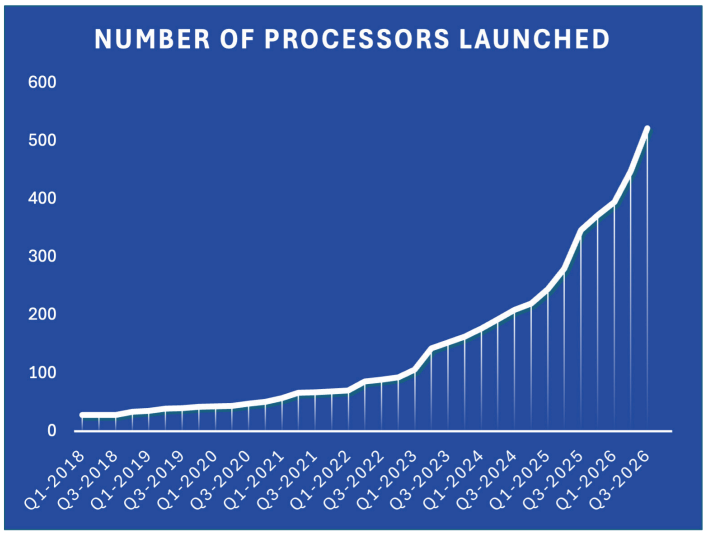


ABOUT XIPHOS

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

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