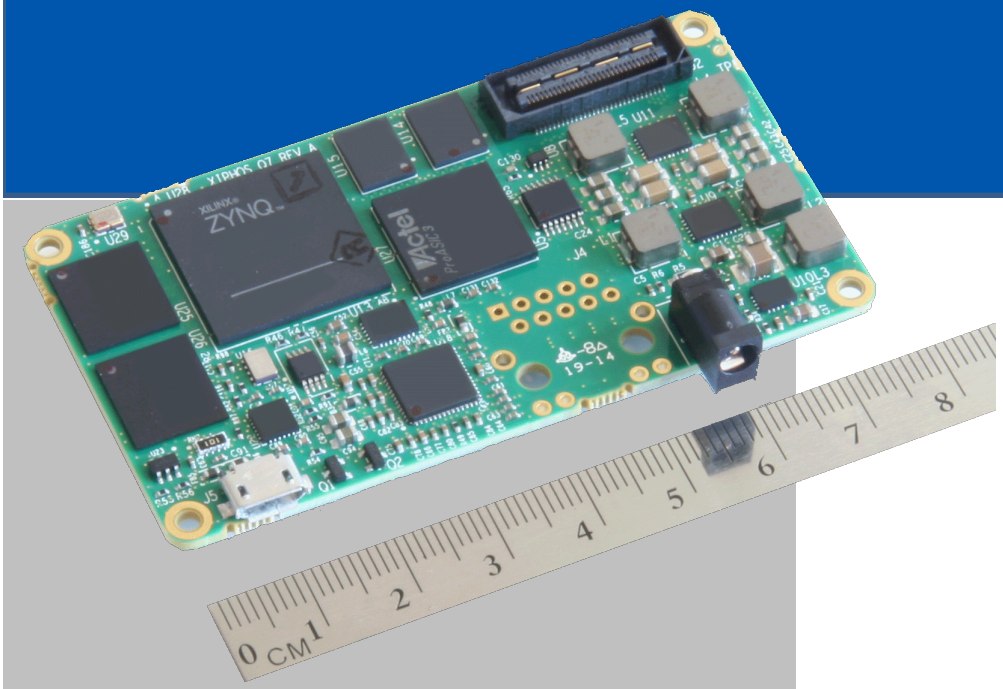
Q7S SPECIFICATIONS

SpaceQuest
Licensed Reseller of Xiphos Products
3554 Chain Bridge Rd, Ste 400
Fairfax, VA 22030
(703) 424-7801
sales@spacequest.com



Q7S

FEATURE HIGHLIGHTS

Industry-Leading Performance	The Q7 features an All-Programmable System-on-Chip (AP SoC), including multi-core CPUs supported by massive programmable logic resources and a wide array of hardware interfaces.
Low Mass, Volume, Power	The Q7 measures 78 mm x 43 mm x 9 mm, has a mass of 24 g (excluding connectors) and consumes 1 W for typical applications. Its small size, low mass and power consumption make the Q7 ideal for aerospace applications.
Flexible Interfacing	The Q7 provides Gigabit Ethernet networking through its RJ45 connector, and USB 2.0 OTG. The Q7 also provides multiple digital I/O lines, including up to 24 LVDS pairs , and selectable RS-232/422/485 through its mezzanine connectors.

With additional Q7S logic and software features for robustness in space environments:

TMR Logic	TMR (Triple Mode Redundancy) can prevent errors in the firmware from propagating and in some cases, correct them.
EDAC for RAM	EDAC (Error Detection and Correction) logic and software can detect and correct errors and scrub the RAM
Health Monitoring	The Q7S can detect error events and failures, monitor system statistics and report these as telemetry.
And several others...	Other features based on years of flight heritage, such as low power modes, multiple firmware and software images, and Zynq logic scrubbing.

XTI-2001-2020-a Q7S_SQL-ver-20160602

OVERVIEW

The Q7S is the latest in the Xiphos Q-Card family of low-cost, embedded nodes for control, processing and interface applications, primarily for aerospace markets. Q-Cards combine a small form factor with broad networking, processing and I/O capabilities.

The Q7S is consists of a Q7 card which is ultimately capable of being used in space, loaded with space-ready software and firmware and rigorously tested.

At the core of each Q7S is a hybrid environment of powerful CPUs and reprogrammable logic, providing consistent, reliable performance. The library of logic and software functions is augmented by onboard analog and digital I/O.

FLIGHT HERITAGE

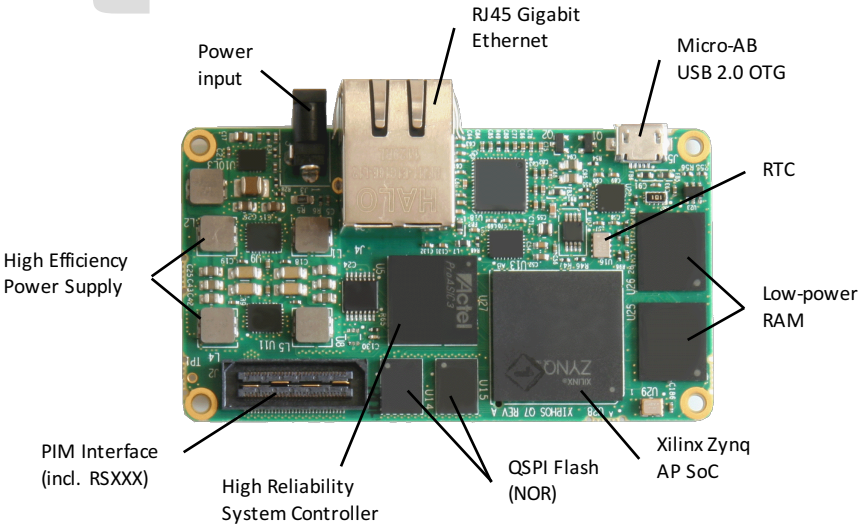
The Q7S is the latest in a line of space qualified boards. The first commercial flight of the Q7S hardware is planned for Q3 2015. Q7S predecessors include the Q6, Q5 and Q4:

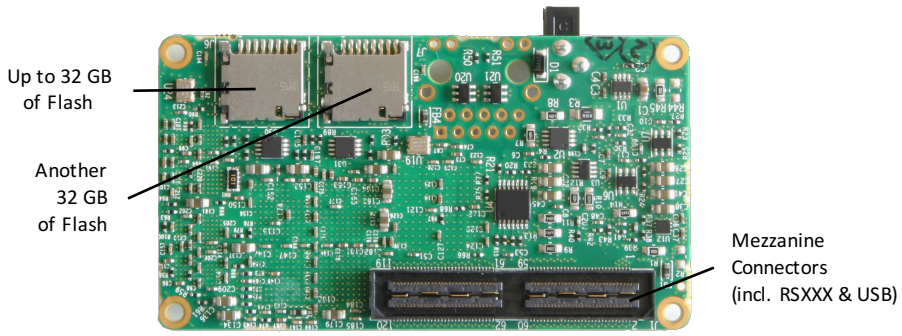
- The Q6 was first flown in August 2011, and almost 100 units have been delivered to customers worldwide to date
- The Q5 was first flown in June 2004 and has been operating continuously in orbit since June 2006
- The Q4 is certified for manned space flight and has been used on the International Space Station

Xiphos Technologies

Q7S

Front & Back





Product Integration Module (PIM)
Each Q7 is delivered with a detachable PIM, to facilitate development. The PIM provides standard commercial interfaces (e.g. CAN, JTAG, 4 analog input, 1-wire), 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 Windows and Linux workstations. ***Code previously developed for Linux desktop and server applications can be easily ported to the Q7.*** Q7 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.

Xiphos Technologies

Characteristics

Memory
- Independent 1x512 MB and 1x256 MB LPDDR2 RAM chips
- 2 MicroSD slots (max. 32 GB each) on independent buses / power control
- 2x 64 MB QSPI Flash (NOR)
- External mass memory interface

All-Programmable System-on-Chip
- Xilinx Zynq-7020
- ARM® dual-core Cortex™-A9 MPCore processors each up to 766 MHz
- 106,400 flip-flops (FF) and 53,200 look-up tables (LUT)
- DSP Slices 220

Control FPGA
- Actel ProASIC3

Operating System
- Linux 3.10+
- Optional alternative configurations, including RTEMS or bare-metal

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

Power
- Scalable, typ. 1 W
- 6 V to 28V (options available for < 6V)
- Power modes (including deep sleep)
- Overcurrent detection and protection

Mass
- 32 g with RJ45 connector
- 24 g without RJ45 connector

Form Factor
- 78 mm x 43 mm x 19 mm (with RJ45 connector)
- 78 mm x 43 mm x 9 mm (without connectors)

Environmental
- Operating Temperature -40C to +85C

Interfaces
- Gigabit Ethernet (RJ-45)
- USB 2.0 (Micro-AB)
- Software selectable RS232/422/485
- Mezzanine connectors (90 I/O, up to 24 LVDS pairs)

Space-Qualified Software
- Triple-mode redundancy
- EDAC-protected RAM
- Upset monitoring
- FPGA Bit-stream scrubbing
- Software robustness / watchdog
- … plus many other features

www.xiphos.com