ZHP PAYLOAD COMPUTER

HIGH-PERFORMANCE FPGA-BASED PAYLOAD COMPUTER WITH DUAL-CORE CPU DESIGNED FOR VERSATILE CUBESAT AND SMALL SATELLITE PAYLOADS

ZHP is a a **high-performance, power-efficient** payload computer with small form factor tailored for CubeSat and Small Satellite missions. It features a Zynq Computer on Module with dual-core Cortex-A9 CPUs, an FPGA, and extensive I/O options for satellite payload applications.

- High-performance Zynq platform with **dual-core Cortex-A9** (up to 766 MHz)
- **Small form factor** (95.0 x 90.0 mm) optimized for CubeSat structures
- **Versatile I/O interfaces**, including SpaceWire, Ethernet, and PCIe Gen2
- **FPGA** available for user-defined applications and interface expansion

- **Power-efficient design** with low power consumption (2.8W idle, 3.5-7W active)
- Linux-based OS with Yocto support for custom software development
- **Compatible with Cubesat Space Protocol (CSP)**
- **Technical support for custom development and design review**
- **Flight proven design**

Applications

▷ Satellite payload data processing

▷ Attitude Control System

▷ Real-time video and image processing

▷ Scientific experiment data collection

▷ SDR applications

Interfaces

▷ PC/104 Connector: 2x CAN, I²C, power, PPS (configurable in/out)

High-speed interfaces

▷ SpaceWire (up to 200 Mbps)

▷ 1 Gb Ethernet, 100 Mb Ethernet

▷ PCIe Gen2 x4 (external storage support)

Peripheral Interfaces

▷ USB 2.0 (OTG support)

▷ 3x RS-422/485 interfaces

▷ SPI, UART, and I²C (shared with PC/104)

▷ Debug: JTAG, serial console, control signals

Extension Port

28 differential pairs (or 56 single-ended signals) and power pins directly connected to FPGA

Software

▷ Operating System: Linux (Yocto-based)

▷ Available Software Packages: Python, Java, GStreamer, and more through 3rd-party Yocto layers

▷ Supported Protocols: Cubesat Space Protocol (CSP)

▷ Custom Development: FPGA can be programmed for user applications and additional interfaces via extension port

TECHNICAL SPECIFICATIONS

MEMORY

RAM	1 GB
Integrated	2x16 GB
External (optional)	up to 300 GB

THERMAL

Operating Temperature	-20°C to 40°C
Storage Temperature	-40°C to 60°C

POWER AND CONSUMPTION

Parameter	Min.	Typ.	Max.	Unit
Input Voltage	5	12	15	V
Power Consumption (Idle)	TBD	2.8	-	W
Power Consumption (Active)	-	3.5	7	W

PHYSICAL CHARACTERISTICS*

Configuration	Mass (g)	Size (mm)
Without SSD, no shielding	79	-
With SSD, no shielding	89	-
Shielded (w/o SSD)	152	95.0×90.0×16.3
Shielded (w/ SSD)	172	95.0×90.0×18.4

* Excluding PC/104 connector, physical characteristics may vary based on selected options
Radiation tolerance: 20 krad (TID)