

Introduction

The Frontgrade™ Reconfigurable Processing System™ (RPS-PS) includes the SpaceVPX Reconfigurable Processing Module (RPM-PS) with an AMD/Xilinx® XQR-Grade VC1902 System-on-Chip (SoC) with dual A72 ARM cores (up to 1.7 GHz) and dual Cortex-R5 cores. Programmable logic may be implemented by the end user to allow high-throughput SpaceWire and Ethernet data switching. Compact 3U design with a customizable XMC+ mezzanine allows for tailoring I/O to meet program requirements. Development dongle is available to access the I/O on the SBC using JTAG, UART, or Ethernet for software development.

Reconfigurable Processing Module: RPM-PS

Features

Processing / Data Rates / Connectivity

- Processor: Versal® VC1902 System-on-Chip (SoC) with dual A72 ARM™ cores (up to 1.7 GHz) and dual Cortex-R5® cores (up to 750 MHz)
- Volatile Memory: 16 GB DDR4 memory
- Non-Volatile Boot Memory: 8 Gbits QSPI memory
- Non-Volatile Storage: 1Tb maximum of raw data storage in SLC mode

When configured with the RPS™ mezzanine card:

- One 100Base-TX and four 1000Base-T ports
- Four SpaceWire ports of up to 200 Mbps per port
- Redundant RS422 1PPS inputs
- One RS422 UART
- Discrete IOs: 3 LVDS inputs, 1 LVDS pulse output, 1 LVTTTL/LVCMOS input, and 4 LVTTTL/LVCMOS outputs

DEVELOPMENT ENVIRONMENT

- Separate development dongle for interface with
- SmartLynq+ System Debugger
- Vivado® 2023.2 development environment
- PetaLinux Linux Support Package (LSP)

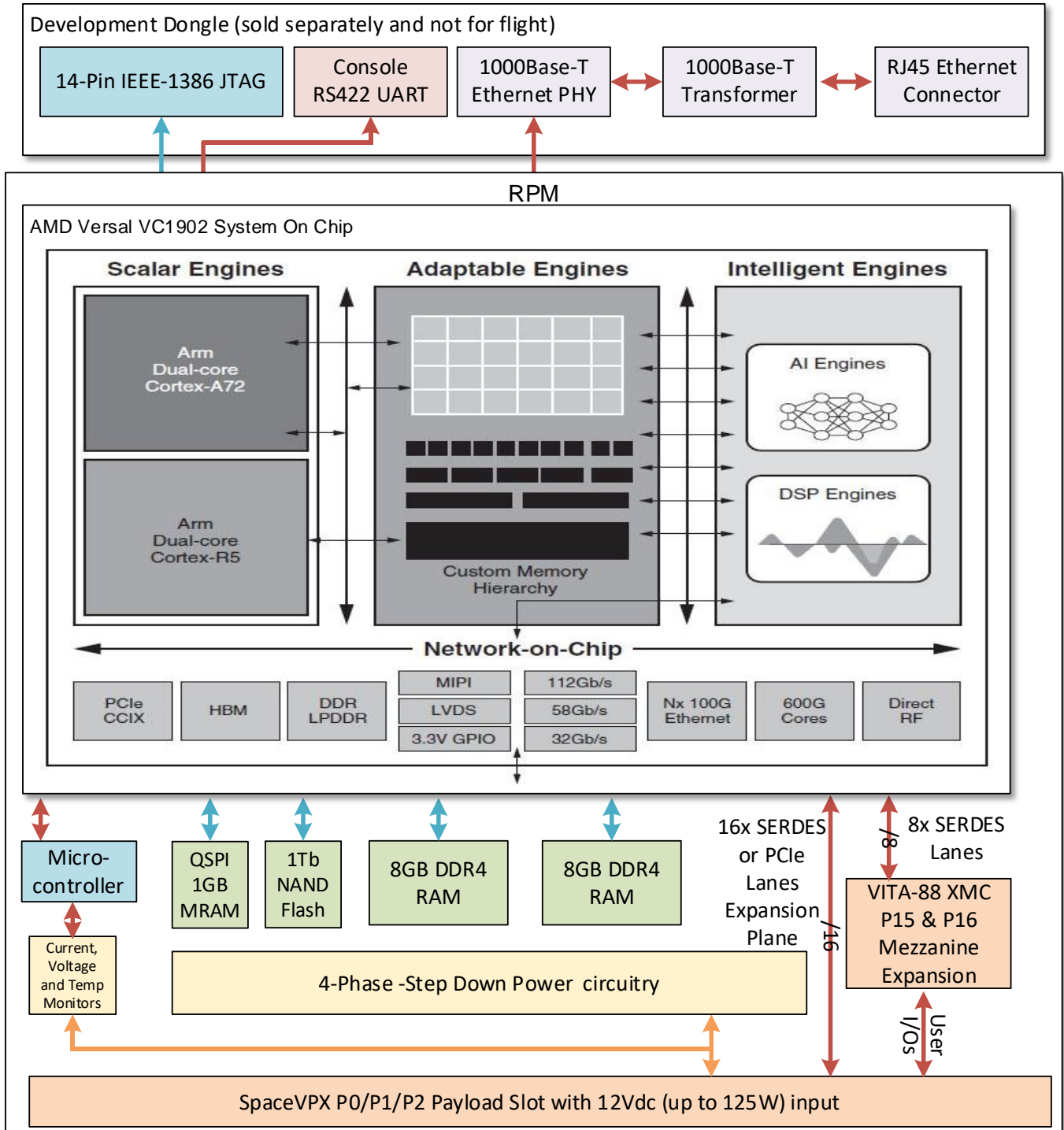
Mass / Volume / Thermal

- Mass: less than 2 kg (estimated)
- Dimensions: 195 mm (L) x 120 mm (W) x 90 mm (H); ICD including mounting hole pattern with six blind inserts
- Maximum operating temperature mounted on a regulated thermal interface: 52°C
- Maximum power consumption: 125W (80W maximum for Versal SoC 0.8 Vdc core voltage)

OPERATIONAL LIFE / RELIABILITY AND PERFORMANCE

- System reliability over 0.9
- System SEU rate: No more than one per year for typical LEO Missions
- TID of 25 krad (Si) or 100 krad (Si) optional assuming 100 mils of shielding with 6061-T6 Aluminum
- NASA PEM-INST-001 Level-2 parts

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