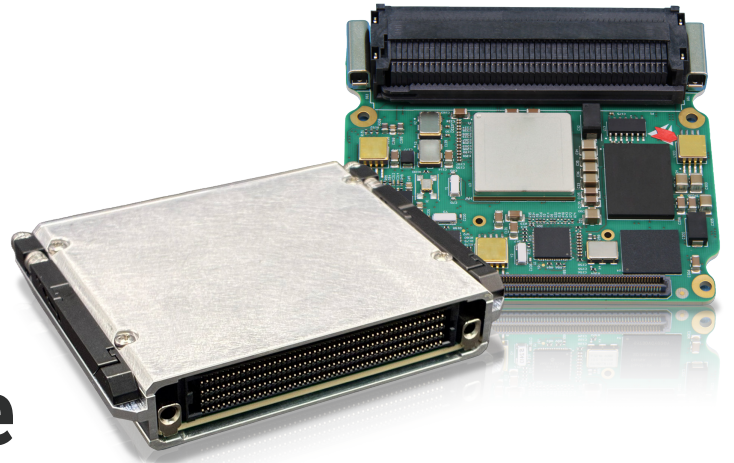


RPMG1-VNXP

Reconfigurable Processing Module



High-Performance, Scalable Edge Processing for Real-Time Space and Defense Missions

The RPMG1-VNXP is a reconfigurable processing module designed for space and defense applications, delivering high-performance onboard computing in a compact, rugged form factor. As part of the MAMBA ecosystem, a modular, standards-based architecture, it enables scalable, upgradeable mission processing from proliferated LEO constellations to Class A national security missions.

Powered by the AMD Versal™ VE2302 SoC, the RPMG1-VNXP combines adaptive compute, deterministic control, and high-bandwidth data processing in a SWaP-optimized design. It features 8GB DDR4 memory with ECC, 32GB e.MMC storage, and radiation tolerance exceeding 30 krads for reliable operation in harsh environments. The module supports real-time AI/ML inference, DSP processing, and multi-sensor data fusion at the edge, helping overcome onboard processing limits and downlink constraints.

Built on the VITA 90 19mm VNX+ form factor, it integrates seamlessly with power, analog I/O, and compute modules, enabling rapid deployment of flexible, multi-mission systems with reduced integration risk.

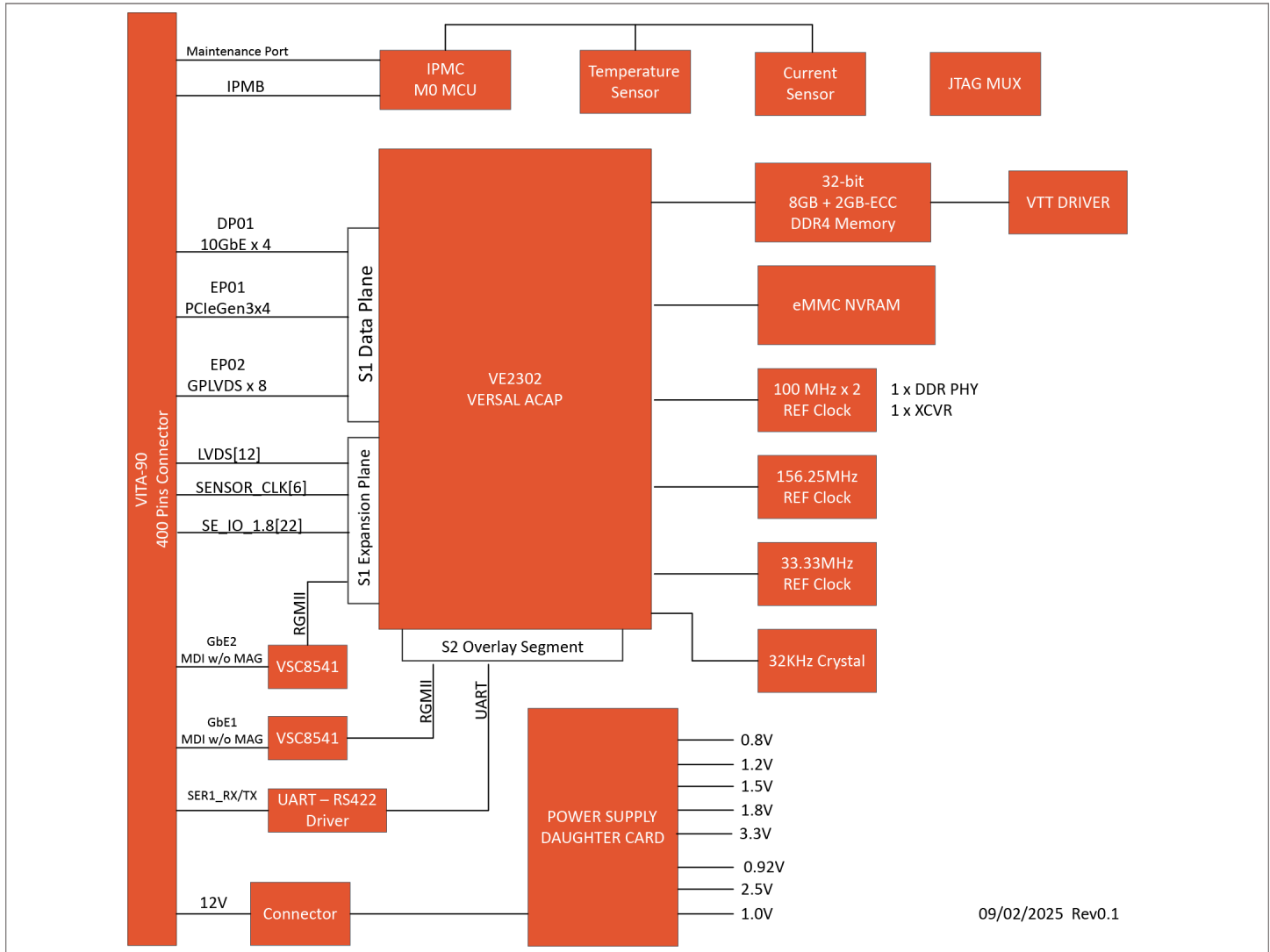
With the RPMG1-VNXP, users can make faster, more informed decisions while minimizing data transmission and enabling advanced capabilities such as target recognition, SDR, and SAR processing, delivering more capability with fewer resources in a future-ready platform.

Features

- AMD Versal VE2302 SoC for adaptive compute and AI acceleration
- 8GB DDR4 (2400 MT/s) with SECDED ECC
- 32GB e.MMC 5.1 onboard storage
- Supports Class A, B, C, D and EDU flight configurations
- Modular MAMBA ecosystem compatibility

Applications

- Edge AI/ML processing (orbit detection, target recognition)
- Software Defined Radio (SDR); Synthetic Aperture Radar (SAR) processing
- Multi-sensor data fusion (RF, optical, radar payloads)
- LEO satellite constellations and proliferated space architectures



09/02/2025 Rev0.1

Specifications

- Radiation tolerance >30krads(Si), SEL immunity >37 MeV-cm²/mg
- SWaP-optimized design (<0.6 kg, <40W max)
- VITA 90 compliant 19mm VNX+ form factor

Processing System (PS)

- AMD Versal VE2302 with multi-core Arm processors
 - Dual-core Arm® Cortex®-A72
 - Dual-core Arm® Cortex®-R5F
- Real-time control and system management
- Integrated security and high-speed interconnects

Programmable Logic & Acceleration

- Optimized for SDR, SAR, and multi-sensor data fusion
- Versal AI Edge with AI Engine and DSP acceleration
- Reconfigurable logic for AI/ML and signal processing
- Low-latency, high-throughput data processing

User Memory

- 32GB e.MMC 5.1 non-volatile storage
- 8GB DDR4 (2400 MT/s) with SECDED ECC
- Optimized for high-bandwidth workloads

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