

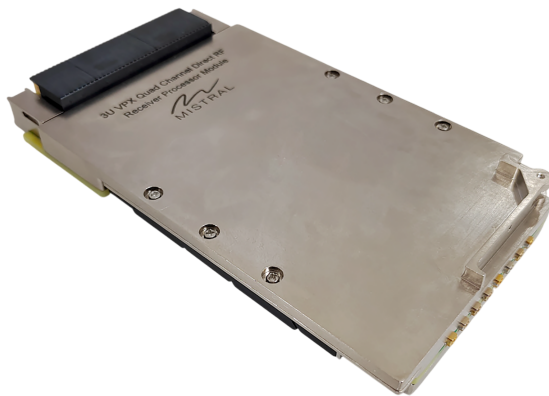
## DATA SHEET

# VPX3U-AGRW014 Processing Card

**3U VPX SOSA Aligned Processing Card with Altera Agilex® 9 Direct RF FPGA**

## OVERVIEW

The VPX3U-AGRW014 Processing Card from Mistral is a high-performance, SOSA™-aligned 3U OpenVPX card built around the Altera Agilex 9 Direct RF FPGA, designed for mission-critical outdoor applications such as Radar, Electronic Warfare (EW), and Signal Intelligence (SIGINT).



Engineered for applications demanding exceptional compute power and advanced signal processing, the VPX3U-AGRW014 integrates the Agilex 9 FPGA, and Cortex A53 Quad Core ARM with high-performance wideband data converters for superior fidelity and robust processing capabilities. The card's architecture leverages Intel 10 nm SuperFin technology to achieve a high channel density with transceiver rates up to 58 Gbps, ensuring ultra-low latency and exceptional data throughput.

Designed to meet high-speed, high-channel density requirements, the VPX3U-AGRW014 excels in environments where real-time data processing and low latency are critical, delivering significant SWaP-C (Size, Weight, Power, and Cost) benefits for mission-critical applications.

The VPX3U-AGRW014 Processing Card achieves industry-leading performance with 64 GSps Direct RF processing, setting a new standard for low-latency, high-bandwidth 3U VPX solutions. Designed for advanced networking, the card incorporates 40Gb Ethernet and aligns with SOSA™ standards, promoting flexible system interoperability and multi-mission configurations. A customizable Analog Interface Mezzanine Site provides adaptable front-end options tailored to specific mission requirements. The card includes a full Board Support Package to streamline application development, and its VHDL flow is compatible with High-Level Synthesis (HLS), offering enhanced programming flexibility and support for high-level design workflows.

## HIGHLIGHTS

- ▶ High-performance 3U OpenVPX Processing Card aligned with SOSA™ standards
- ▶ Built around the Altera Agilex 9 Direct RF FPGA (AGRW014)
- ▶ ARM Cortex-A53 Quad-Core Processor for powerful processing in mission-critical applications
- ▶ Integrated 4-Channel ADC & DAC
- ▶ Integrated high-fidelity wideband data converters
- ▶ Transceiver rates up to 58 Gbps for ultra-low latency and high data throughput
- ▶ Supports high-speed, high-channel density processing requirements
- ▶ Real-time data processing capabilities with low-latency interface
- ▶ Ideal for rugged outdoor environments requiring reliable, high-performance computing
- ▶ Full Board Support Package for efficient application development
- ▶ VHDL flow compatible with High-Level Synthesis.

## SPECIFICATIONS

### FPGA Processor

- Altera Agilex 9 Direct RF FPGA SoC AGRW014 - 10 nm SuperFin process technology FPGA
- ARM Cortex-A53 Quad-Core Processor
- 4-channel ADC/DAC with a sampling rate of 64 Gbps and a resolution of 10 bits
- Transceiver rates up to 58 Gbps
- 18x19 Multipliers: 9020
- Logic Elements: 1437 kLE
- Embedded Memory: 190 Mb
- PCIe Interface: Up to one Gen4 x16 or two Gen4 x8, or four Gen4 x4
- Protocol Support: VITA 46/SOSA IPMC

### ADC (Analog-to-Digital Converter)

- 4 Channels
- Sample Rate of up to 64 Gbps
- 10-bit Resolution
- Instantaneous bandwidth: supports up to 4 GHz
- RF Analog Bandwidth of 36 GHz

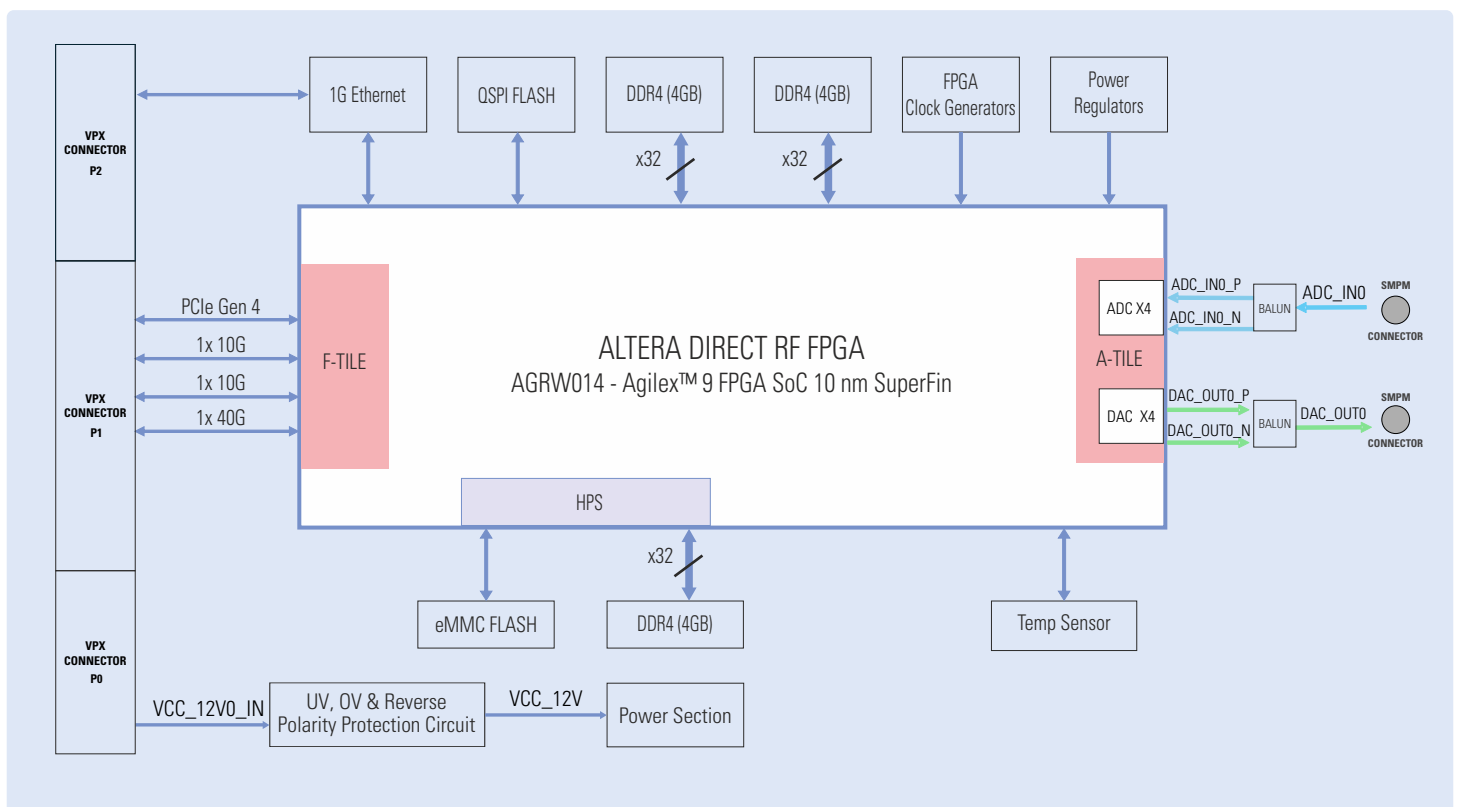
### DAC (Digital-to-Analog Converter)

- 4 Channels
- Sample Rate of up to 64 Gbps
- 10-bit Resolution
- Instantaneous Bandwidth up to 4 GHz
- Supports up to 4 simultaneous carriers per channel
- RF Analog Bandwidth of 36GHz.

### Interfaces

- 2x 4 GB DDR4 Memory at FPGA
- 4 GB DDR4 Memory at HPS/ARM
- 1Gbits Quad-SPI NOR Flash
- 256Gbits eMMC NAND Flash
- 1G Ethernet Port
- 2x 10G Ethernet Ports
- 40G Ethernet Port
- PCIe Gen4 x4 Interface
- JTAG Port
- 4x ADC Channels - 50 Ohm Single ended Inputs
- 4x DAC Channels - 50 Ohm Single ended outputs.

## BLOCK DIAGRAM



### Backplane and Protocol Support

- ▶ Supports VITA 46 with high data rate VPX Connectors for backplane connectivity
- ▶ Protocols include 10/40Gb Ethernet, PCIe Gen4.

### Software

- ▶ Altera Quartus Prime Pro for designing, debugging and programming FPGA

### Mechanical and Environmental Specifications

- ▶ Form Factor: 3U OpenVPX (VITA 46)
- ▶ Cooling Options: Air, Air-Flow-Through, and Conduction-cooling
- ▶ Temperature Range: Operational up to 71°C ambient air; -40°C power-on; storage temperature of -55°C to 105°C
- ▶ Power Requirements: +12V from the backplane SOSA™ Technical Standard: Designed in alignment with SOSA™ for standardized, multi-vendor interoperability.

## APPLICATIONS

- ▶ Electronic Warfare (EW) Systems
- ▶ Radar and Signal Intelligence (SIGINT)
- ▶ High-end Test and Measurement Equipment
- ▶ 5G/6G Wireless Communication Infrastructure
- ▶ Space and Aerospace Signal Processing
- ▶ Quantum Computing.

## DELIVERABLES

- ▶ VPX3U-AGRW014 Processing Card
- ▶ Associated Software Drivers and Manual
- ▶ User Manual (PDF).

## WARRANTY

This product has standard one year warranty.

## ORDERING

For ordering information please email us at [sales@mistralsolutions.com](mailto:sales@mistralsolutions.com) or call +1-408-705-2240 for USA and +91-80-4562-1100 for rest of the world.

## ABOUT MISTRAL

Mistral, an AXISCADES subsidiary, is a leading technology design and systems engineering company offering end-to-end Chip-to-Product solutions for Aerospace, Defense and Electronics, Semiconductor & AI (ESAI). With three decades of domain expertise, Mistral has emerged as one of India's premier embedded systems service providers, delivering value across the complete product engineering lifecycle.

Our solutions address the growing need for intelligent and reliable devices enabling innovation, accelerating time-to-market, and driving digital transformation. Backed by multidisciplinary capabilities, Mistral excels in advanced system design, powering the development of cutting-edge embedded computing solutions for complex mission-critical environments.



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