

## 3U VPX SOSA Aligned Dual ADRV9002 Module

### Overview

PanaTeQ's VPX3-SDR-C/D is a 3U VPX SOSA RF aligned module based on the Zynq UltraScale+ MultiProcessor SoC device from Xilinx and one **ADRV9002** (Model C) or two **ADRV9002** (Model D) RF Wideband Transceivers/Receivers from Analog Devices for a broad range of applications such as Software Defined Radio, MILCOM, massive MIMO, Phase Array Radar and Electronic Warfare.

The two ADRV9002 are implemented to provide up to 4 TX/RX channels at the frond-end or rear-io RF interfaces VITA 67.3.

The baseband processor is a Zynq UltraScale+ MPSoC that integrates a Quad-core ARM Cortex-A53 based Application Processing Unit (APU), a Dual-core ARM Cortex-R5 based Real-Time Processing Unit (RPU), an ARM MALI-400 based Graphic Processing Unit (GPU) and an UltraScale+ Programmable Logic (PL) in a single device. It also includes on-chip memory, external memory interfaces, and a rich set of peripheral connectivity interfaces.

The board can be ordered with different versions of the ZynQ UltraScale+ MPSoC family of devices, coupled with up to 8GB 64-bit DDR4-2400 Processing Memory with 8-bit ECC.

Up to 8GB 64-bit of DDR4-2400 is also available as the Programmable Logic Memory, allowing data streaming applications such as video CO-DEC and signal processing. 128GB of soldered eMMC managed NAND Flash is available for local data storage.

The VPX3-SDR-C/D provides frond-end RF I/O interfaces using high density RF connectors nano RF VITA 67.3.

A large number of the ZynQ Ultrascale+ MPSoC PS peripherals are available on the on-board connectors:

1x ETH 1000Base-T, USB, 2x RS232/422/485, GPIO,.

The VPX3-SDR-C/D is delivered with a PetaLinux BSP and a reference HDL/SW design as standard.

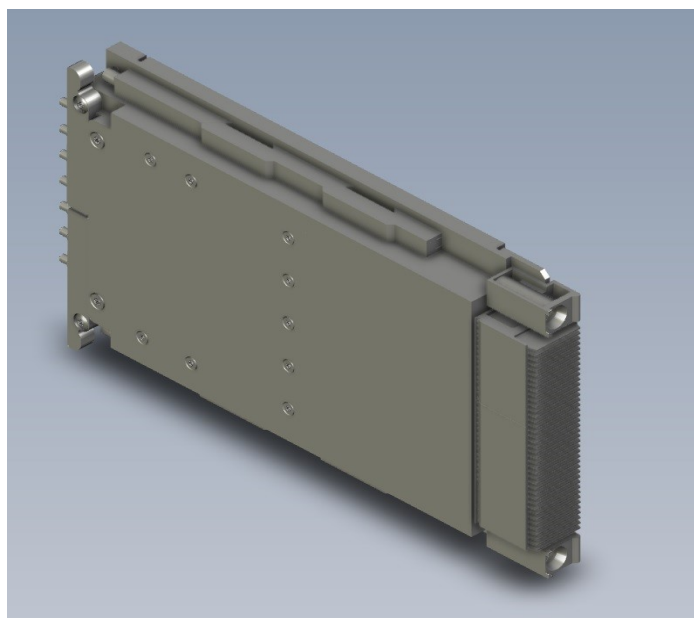


### Key Features

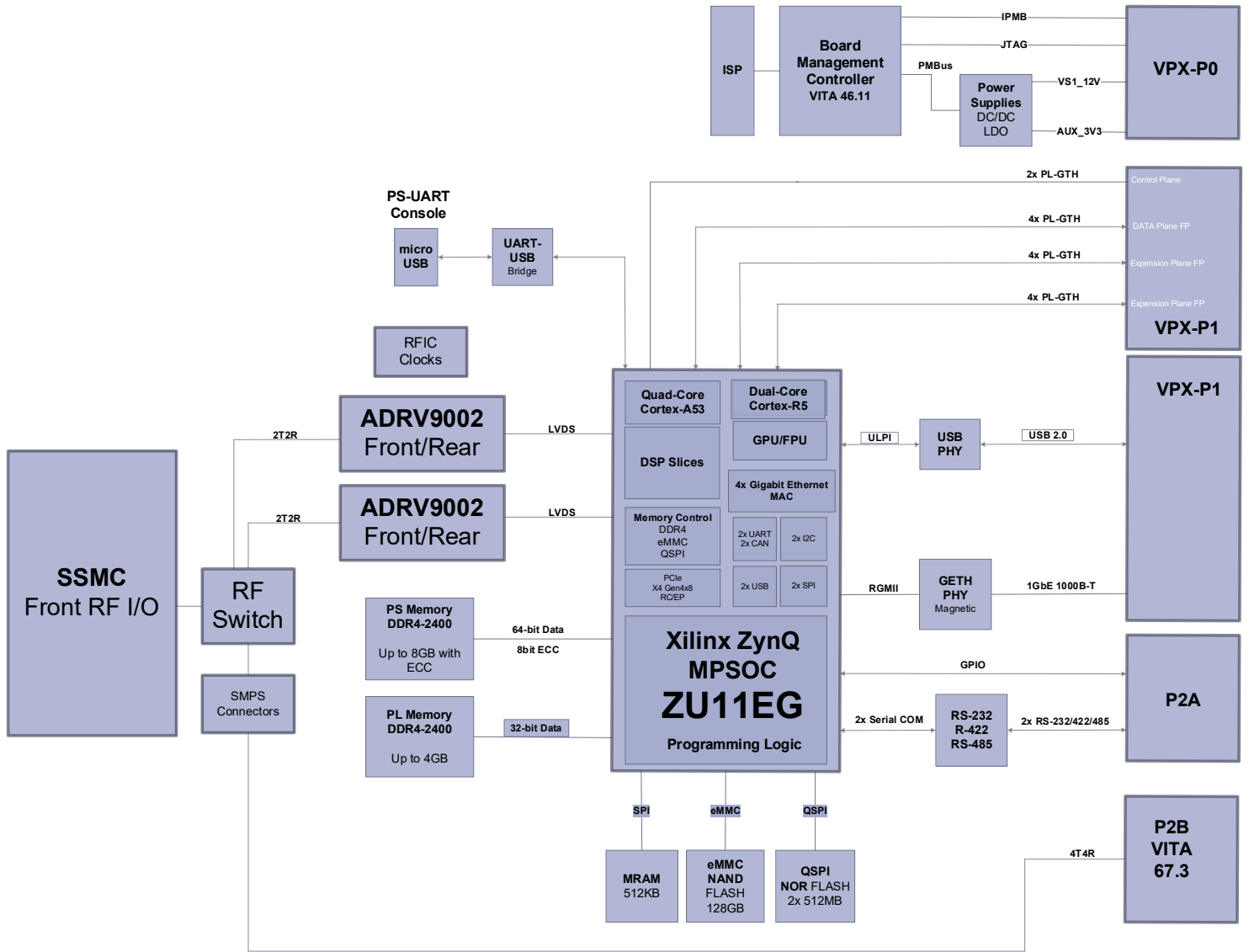
- 3U VPX RF SOSA Aligned module
- SOSA Profil: Please contact us
- **Model A:** 2T2R 1x **ADRV9002** RF Wideband Transceiver
- **Model B:** 4T4R 2x **ADRV9002** RF Wideband Receivers
- 2T2R (Model A) and 4T4R (Model B)
- Wide tuning range 30MHz to 6GHz
- RF Transmitters and Receivers Bandwidth 12KHz-40MHz
- Fully integrated DPD
- Fast frequency hopping
- TDD and FDD mode support
- Independant or synchronized PLL clocking support (Model B)
- Xilinx **Zynq UltraScale+ MPSoC** as the Baseband Processor
- ZU7Cx and ZU11EG FFVC-1156 Package
- 20x GTH at up to 16.3 Gb/s Transceivers
- Up to 8GB DDR4-2400 64-bit PS memory with 8-bit ECC
- Up to 4GB DDR4-2400 32-bit PL memory
- eMMC 128GB (V4.51) muxed with microSD card slot, MRAM 512KB
- 1x ETH 1000Base-T ZynQ MPSOC
- ZynQ PS-UART USB console
- BMC UART console
- USB 2.0, GPIOs
- 2x RS.232/422/485
- Air Cooled and Conduction Cooled

### Typical Applications

- MILCOM
- Software Defined Radio



## Block Diagram



## Board Specifications

### 3U VPX Interfaces

- VITA 46.0/46.4/65.0 VPX/OpenVPX Specifications compliant
- 8x MGT connected to/from Zynq MPSoC MGT
- 2x1000BASE-X/SGMII links on VPX Control Plane
- 1x1000BASE-T, 2x RS-232/422/485, 1x USB 2.0, GPIOs
- Board Management Controller (BMC) Interface. VITA 46.11 Ready
- System Controller capability
- JTAG

### Xilinx Zynq MPSoC

- Supported Devices: **ZU7CG/ZU7EG/ZU7EV** and **ZU11EG** FFVC1156 Package (Speed Grade –1/2)
- Processing System : Quad-Core ARM A53, Dual-Core ARM R5, 2x SATA, 2x USB, 4x GETH MACs
- Programmable Logic: 508 (ZU7) or 653K (ZU11) Logic Cells
- On-Chip Memories: 30,8 (ZU7) or 43,6Mb (ZU11)
- DSP Slices: 1728 (ZU7) or 2928 (ZU11)
- High Speed Serial Links: 20 full duplex, high performance, GTH Multi-Gigabit Transceivers (MGT) @ up to 16.3 Gb/s
- Supported by PanaTeQ's FPGA Development System (**PAN-PSDK**)

### External Memories

- Up to 8GB of DDR4-2400 Processor System (PS) memory, 64-bit data, 8-bit ECC
- Up to 4GB of DDR4-2400 Programmable Logic (PL) memory, 32-bit data, no ECC
- 128GB eMMC of managed NAND Flash memory. HS200 support @ up to 100MB/s
- 512KB of SPI MRAM (NVRAM)
- 2x 1Gb of QSPI NOR Flash memory for booting Zynq MPSoC Programmable Logic and Firmware Processing System

### ADRV9002 RF Channel Performances (per device/channel)

- Frequency of 30MHz to 6.0GHz
- Transmitter and Receiver bandwidth from 12KHz up to 40MHz
- Fully integrated DPD for narrow-band and wideband waveforms
- Fast frequency hopping
- Multichip synchronization capabilities

### Environmental Specifications

- Compliant with VITA 47 specification. Please contact PanaTeQ for more information

## Product Codification

The VPX3-SDR can be assembled with different versions and various amounts of memory storage. The cooling technique et ruggedization level are also available options. The following table shows the product coding for all these options.

# VPX3-SDR-C-A1N-AS

	Device	RF / IO
C	1x ADRV9002	2T2R
D	2x ADRV9002	4T4R

	Device	ARM A53 Cores	GPU	VCU	DSP Slices	System Logic Cells	Memory
A	ZU7CG	2	No	No	1728	504	38.0 Mb
B	ZU7EG	4	Yes	No	1728	504	38.0 Mb
C	ZU7EV	4	Yes	Yes	1728	504	38.0 Mb
D	ZU11EG	4	Yes	No	2928	653K	43.6 Mb

	Device Speed Grade
1	Slowest
2	Fastest

	PS / PL Memory Size
N	4GB/2GB
M	8GB/4GB

	Ruggedization Level	VITA 47
AS	Air Standard	EAC4
AR	Air Rugged	EAC6
CC	Conduction Cooled	ECC3
CR	Conduction Rugged	ECC4

## Ordering Information

The following product references are offered by Panateq as standard products. Other combinations of devices, speed grade, memory, cooling, KVPX and conformal coating can be specially ordered. Please contact us for details

Reference	Device	RF IO	Memory PS/PL	Ruggedization Level
<b>VPX3-SDR-C-D1N-AS</b>	ZU11EG-1FFVC1156E	2T2R	4GB/2GB	Air Standard

Reference	Description
<b>RTM-SDR-CD</b>	Rear Transition Module for VPX3-SDR-C/D
<b>VPX3-SDR-C-D1N-PSDK</b>	VPX3-SDR-C-D1N-AS System Development Kit