

# TECHNICAL DATASHEET

Per Vices Corporation  
High Performance SDR for Interoperable Systems

TECHNICAL SPECIFICATIONS	Min.	Max.
Dynamic range (dB)	25	70
High Dynamic Range Option (Note 1)	90	110
Typical Rx noise figure (dB) (see Note 1)	1.2	7
Max Tx output power (dBm) (see Note 1)	-10	18
Receiver sensitivity (dBm) (See Note 1)	-90	-105
Frequency tuning range (See Note 1)	100kHz to 18GHz	
Tuning time between different frequencies (see Note 2)	2ms	
Fast tuning time between frequencies (see Note 2)	40us	
Storage temperature	0-40 C	
Operating temperature	5-40 C	
Number of FPGA logic elements	350k (Crimson) / 2800k (Cyan)	
Peak floating-point performance (# of TFLOPS)	9.2 (Cyan)	
API documentation	Yes	
Antenna interface (see Note 1)	50Ω SMA	
Data interface (see Note 1)	SFP+ (10GBASE-R) (Crimson) / qSFP+ (Cyan)	
Management interface (see Note 1)	RJ45	
MTBF (see Note 3)	23.6k hrs @ 40degC	
Volume (See Note 4)	19 inch server rack: 1U (Crimson) / 3U (Cyan)	
Mass	8kg (Crimson) / 11kg (Cyan)	
# of receive channels	0-16	
# of transmit channels	0-16	
Receive instantaneous bandwidth at FPGA	Up to 1GHz per channel	
Transmit instantaneous bandwidth at FPGA	Up to 1GHz per channel	
ADC resolution	16 bit	
DAC resolution	16 bit	
ADC sampling rate	up to 320MSPS (Crimson) / up to 1GSPS (Cyan)	
DAC sampling rate	up to 320MSPS (Crimson) / up to 1GSPS (Cyan)	
Frequency resolution	0.0625 Hz	
Frequency accuracy	2ppm (Crimson) / 50 ppb (Cyan)	
Adjustable pulse width	Available	
Real time kernel option	Available	

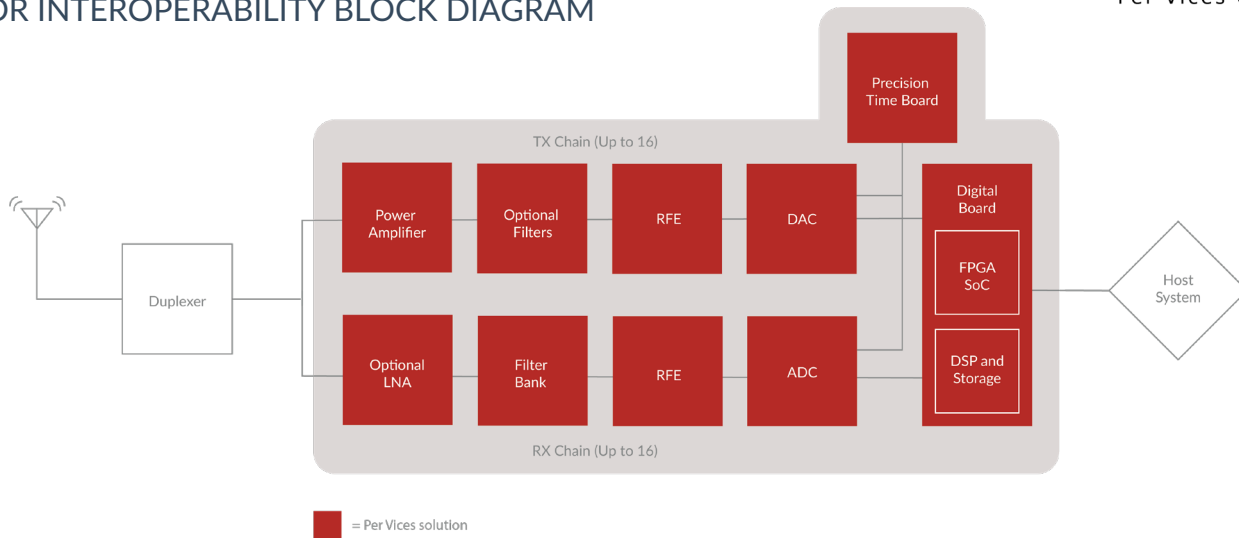
**Note 1:** This parameter may be adjusted to customer requirements.

**Note 2:** Product supports fast tuning times between frequencies that are integer multiples of one other. Arbitrary frequencies may take longer.

**Note 3:** Mean time between failure is calculated assuming sustained operation at environmental limits, and includes any single source of failures, including fans.

**Note 4:** The form factor may be optimized to accommodate SWaP requirements.

## SDR FOR INTEROPERABILITY BLOCK DIAGRAM



## INTERNAL ARCHITECTURE

The Digital board hosts the FPGA to manage communications with the host computer, in addition to in-unit DSP for quick response. With MIMO concerns in mind, our standard radio chassis is sized to house sixteen independently configurable front-end boards – some used for receiving data (Rx) and others used for transmitting data (Tx). The power board distributes power to all boards from a Power Supply Unit compatible with 120V or 240V AC input. Each board has a separate 50 Ohm SMA connector, amplifier, filters, and attenuation controls. To transmit a digitally processed signal, it is first sent to the DAC (digital-to-analog converter). The analog signal is then amplified and filtered for better transmission. On the Rx chain, the ADC samples the incoming wave at up to 1 GSPS on Cyan. The high-sampling frequency allows the system to capture more data-points for processing later on.

## SDR INTEGRATION

We provide high precision timing for systems through network or GPS interfaces. Per Vices SDRs can be tuned between 100 kHz to 18 GHz. This large tuning range includes the radio bands used for 4G and 5G applications. Per Vices' mission critical systems are field tested, and are already integrated into life critical radar applications. These radios can be configured for user SWaP requirements. Our radios are built for 19 inch server racks, with a 10GBase-R or 40GBase-R data interfaces, and a RJ45 Management interface, making them easily adaptable for new or existing systems. Our standard sizes, open architecture and API documentation make it easy to get started. Your system's complexity can be easily managed through a suite of common SDR software tools, while still offloading the computationally intensive DSP portions to the FPGA.

## INTEGRATION CAPABILITIES

API documentation
Antenna interface
Data interface
SoC FPGA and logic elements
Management interface
Open architecture
Size, weight, and power (SWaP)

## PRODUCTION CAPABILITIES

Per Vices scales low, medium, and high volume capabilities to match the size of your project. Our build-your-own SDR tool allows you to select from a wide range of features and certifications. The tool will also provide a rough order of magnitude (ROM) estimate. For more information or if you have more niche requirements, contact us directly and we'll help you out. We provide guaranteed performance on all our SDRs with standard factory test reports and customer specified reports.

## EVALUATION REQUIREMENTS

Get started quickly with our COTS solutions, before proceeding with any optimizations required. This will allow you to use one of our stock products with a host system and UHD compatibility to demonstrate proof of concepts (POCs) and reduce overall risks associated with your project.

## CONTACT US

More information is available at [www.pervices.com](http://www.pervices.com).  
If you have any questions, please contact us at [solutions@pervices.com](mailto:solutions@pervices.com).