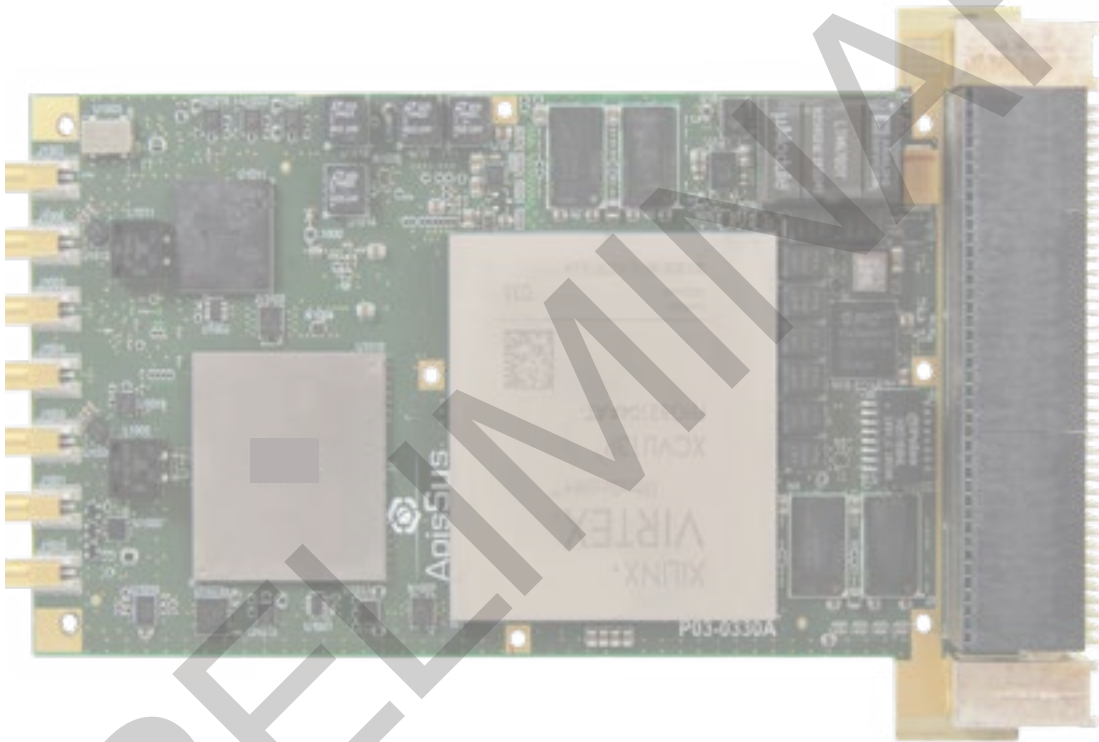




AV 143
Wideband Radar Transceiver
EW-ECM - DRFM

3U VPX
Virtex UltraScale+ FPGA
Single 12 bit 6.4 Gbps ADC-DAC
Or Dual 12 bit 3.2 Gbps ADC-DAC
Conduction or Air-Cooled



Applications

- Electronic Warfare – Electronic Attack
- DRFM
- Radar Transmitter / Receiver
- Wideband Communication

Features

- Dual 3.2 Gbps / Single 6.4 Gbps 12-bit ADC
- Dual 3.2 Gbps / Single 6.4 Gbps 12-bit DAC
- One Ultra Low jitter clock synthesizer
- External or internal sampling clock
- External or internal sampling clock reference
- User programmable Xilinx® Virtex® Ultrascale+™ VU7P/VU9P/VU13P FPGA
- 2x 1G64 DDR4-2666 SDRAM
- 3U OpenVPX standard compliant
- Air cooled and Conduction cooled rugged versions

Specifications

Analog Inputs/Outputs

- Input coupling: AC
- Full power bandwidth: > 8 GHz
- Full scale : TBD dBm
- Output coupling: AC
- Full power bandwidth: > 8 GHz
- Full scale : TBD dBm (NRZ)
- Impedance: 50 Ohm
- Connectors: SMPM

Analog-Digital Conversion

- Dual channel, $F_s \leq 3.2$ GHz
- Single channel, $F_s \leq 6.4$ GHz
- Resolution: 12 bit
- Sampling Performances 6.4 Gsps, -1dBFS
- SNR: 55 dBFS @2.1 GHz
- SFDR: 60 dBc @2.1 GHz
- ENOB: 8.5 bit @2.1 GHz

Digital-Analog Conversion

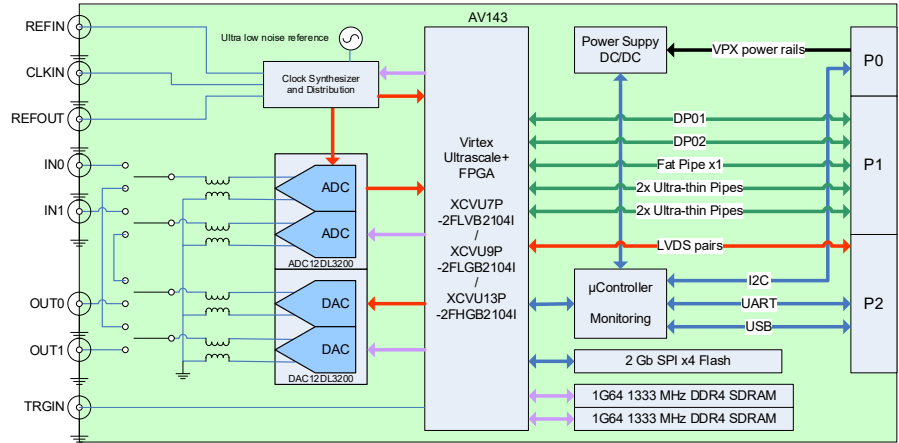
- Dual channel, $F_s \leq 3.2$ GHz
- Single channel, $F_s \leq 6.4$ GHz
- Resolution: 12 bit
- Sampling Performances 6.4 Gsps, 0 dBFS
- SFDR: 67 dBc, NRZ mode @ 2.1 GHz
- NSD: -154 dBc/Hz, NRZ mode @ 2.1 GHz

Clock

- Internal:
 - One ultra-low jitter clock synthesizers,
 - 1.6 GHz to 6.4 GHz low jitter clock
- External Input Clock:
 - Frequency: 1.6 GHz to 6.4 GHz
 - Input level: 10 dBm recommended
 - Connector: SMPM 50 Ohms
- External reference:
 - frequency: 10 MHz to 500 MHz
 - Connector: SMPM, 50 Ohm

Trigger

- External: 0 to 2.5Vp
- Connector: SMPM, 50 Ohms



FPGA

- FPGA: Xilinx Virtex Ultrascale+
- XCVU7P-2FLVB2104I
- XCVU9P-2FLGB2104I
- XCVU13P-2FHGB2104I

Memory

- Two banks 1G64 DDR4 2666 SDRAM
- One 2 Gbit QSPI FLASH memory

VPX interface

- P1:
 - Data plane: two fat pipes
 - Expansion plane: one fat pipe
 - Control plane: 2 ultra-thin pipes
 - 2 user-defined ultra-thin pipes
- P2:
 - USB2.0 and USB to UART
 - 22 LVDS differential pairs, configurable as 44 single ended LVCMOS

Software support

- Software Drivers:
 - Windows 10 64-bits
 - Linux 64-bits
- Application example: Windows and Linux

Firmware support

- VHDL cores for all hardware resources
- Base design
- Supported by Xilinx VIVADO 2022.1 and later

Ruggedization

- As per VITA 47:
 - Air cooled: EAC4 and EAC6
 - Conduction cooled: ECC3 and ECC4

Power dissipation (VU13P)

- +12V: 11.4 A max (137W)
- +3.3VAUX: 0.6 A max (2W)

Weight

- Air cooled : 550g
- Conduction cooled : 650g

Ruggedization levels	AS Air flow, Standard (VITA 47 EAC4)	AR Air flow, Rugged (VITA 47 EAC6)	CS Conduction Standard CS (VITA 47 ECC3)	CR Conduction Rugged (VITA47 ECC4)
Operating Temperature	0°C to +55°C (8 CFM airflow at sea level)	-40°C to +70°C (8 CFM airflow at sea level)	-40°C to +70°C (Card Edge)	-40°C to +85°C (Card Edge)
Non Operating Temperature	-40°C to +85°C	-50°C to +100°C	-50°C to +100°C	-55°C to +105°C
Operating Vibration (Random)	5Hz - 100Hz +3 dB/octave 100Hz - 1kHz = 0.04 g ² /Hz 1kHz - 2kHz -6 dB/octave	5Hz - 100Hz +3 dB/octave 100Hz - 1kHz = 0.04 g ² /Hz 1kHz - 2kHz -6 dB/octave	5Hz - 100Hz +3 dB/octave 100Hz - 1kHz = 0.04 g ² /Hz 1kHz - 2kHz -6 dB/octave	5Hz - 100Hz +3 dB/octave 100Hz - 1kHz = 0.1 g ² /Hz 1kHz - 2kHz -6 dB/octave
Operating Shock	20g, 11 millisecond, half-sine	20g, 11 millisecond, half-sine	40g, 11 millisecond, half-sine	40g, 11 millisecond, half-sine
Operating Relative Humidity	0% to 95% non-condensing	0% to 95% non-condensing	0% to 95% non-condensing	0% to 95% non-condensing
Operating Attitude	@ 0 to 10,000 ft with adequate airflow	@ 0 to 30,000 ft with adequate airflow	@ 0 to 60,000 ft	@ 0 to 60,000 ft
Conformal Coating	No	Optional (acrylic AVR80)	Yes (default acrylic AVR80)	Yes (default acrylic AVR80)

Reference to ANSI-VITA standard 47 for the listed parameters only.

Ordering information

Part Number	AV143	-	rr	-	a
Ruggedization level	Air Standard	-	AS	-	-
	Air Rugged	-	AR	-	-
	Conduction Standard	-	CS	-	-
	Conduction Rugged	-	CR	-	-
Options 1	FPGA Virtex Ultrascale+ VU7P	-	-	-	7
	FPGA Virtex Ultrascale+ VU9P	-	-	-	9
	FPGA Virtex Ultrascale+ VU13P	-	-	-	13

contact: sales@apisys.com

www.apisys.com