

AMC591 – 56 GSPS 8-bit ADC, 2 or 4 channel with XCVU190 UltraScale™

56 GSPS, 8-bit ADC, UltraScale™



KEY FEATURES

- 8-bit ADC at up to dual 56 GSPS
- 2 x 56 or 4 x 28 GSPS channels
- Xilinx UltraScale™ XCVU190 FPGA
- 16 GB of DDR-4 Memory (2 banks of 64-bit)
- ADC is 65 nm CMOS process technology
- Very low power consumption (5 W for the ADC)
- Double module, mid-size or full-size
- Calibration warning and over-range flags
- -3 dB analog input bandwidth nominally 15 GHz
- Internal 14 GHz VCO/PLL per I/Q ADC pair
- Differential analog input: 1.0V PPD
- Tongue 2 for additional SERDES

AdvancedMC™

Benefits of Choosing VadaTech

- Highest sampling rate for the module size in the industry
- Uses MB8AC2070 ADC
- Low power consumption – CMOS process technology
- Flexible selection of sample rate and channel count
- Design utilizes proven VadaTech subcomponents and engineering techniques
- Strong mil/aero support
- Electrical, mechanical, software, and system-level expertise in house
- Full system supply from industry leader
- AS9100 and ISO9001 certified company

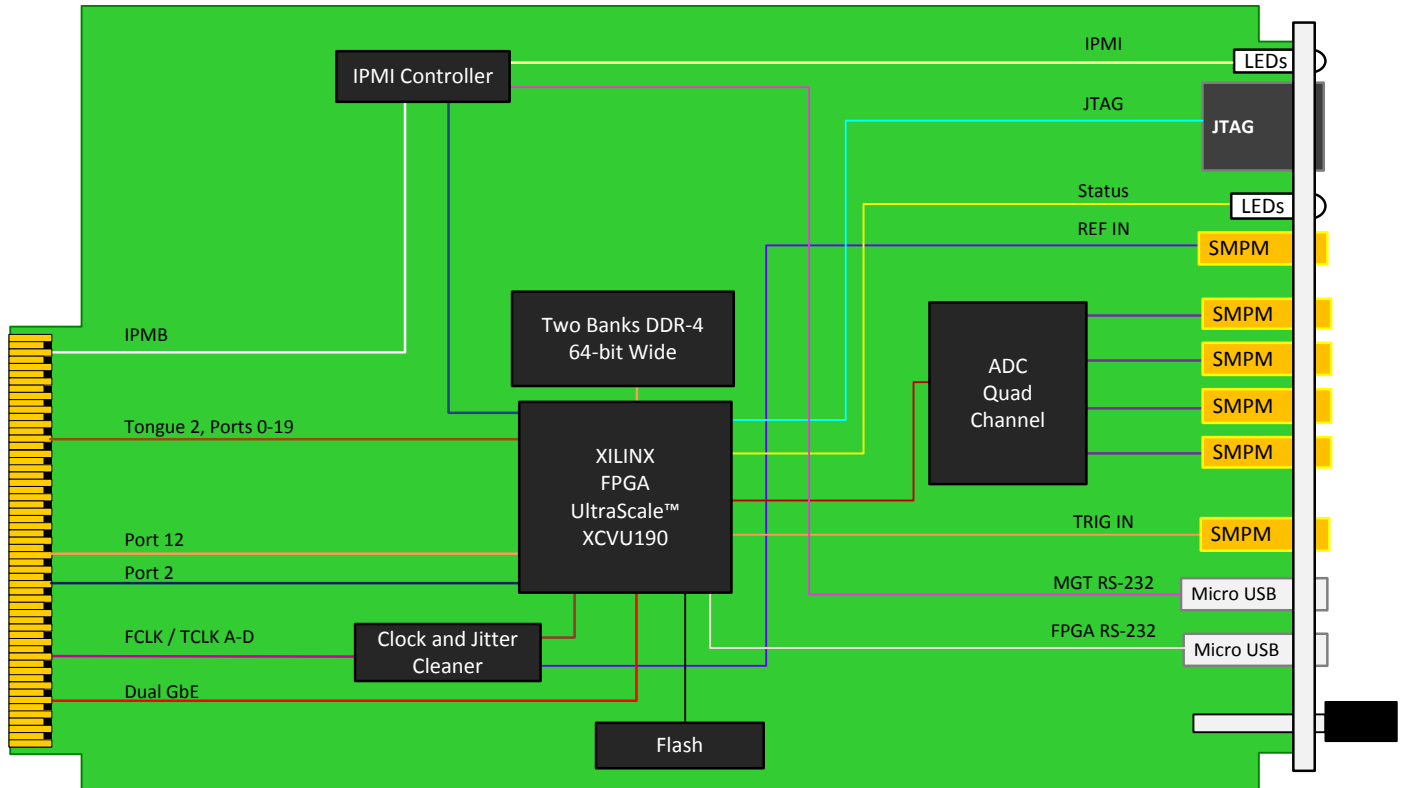
The AMC591 used the Fujitsu MB8AC2070 ADC (Analog to Digital Converter) to provide dual 56 GSPS or quad 28 GSPS from four channels ADC (user selectable). The board is compliant to AMC.0 specifications.

The AMC591 allows the implementation of extremely fast, high-resolution ADCs in CMOS process technology. The ADC is ideal for applications that require ultra-high-performance analog and digital processing such as 100G applications. Achieved input bandwidth depends on system configuration and operating conditions, contact VadaTech for details.

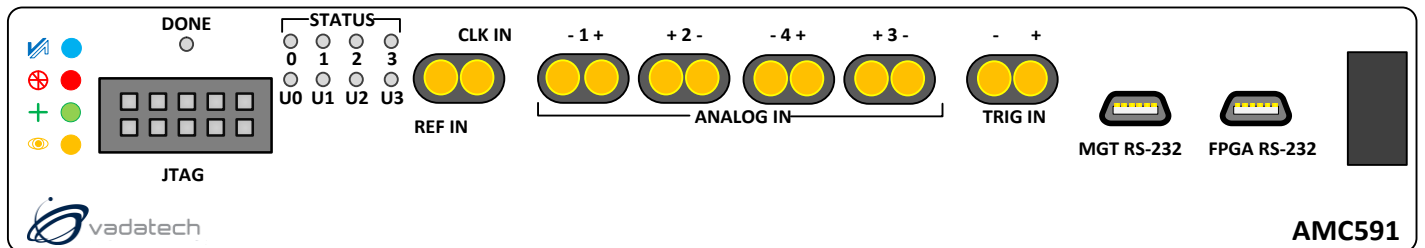
The AMC591 has a Xilinx UltraScale™ XCVU190 FPGA which has 1800 DSP Slices. The FPGA interfaces directly to the AMC connectors over both tongue 1 and tongue 2, supporting up to 22 lanes routed to GTY transceivers for board-to-board connectivity (chassis dependent). The FPGA has 2 banks of 64-bit DDR4 memory (16 GB total).

The tongue 2 connections can also provide dedicated lanes to communicate with high speed processors such as VadaTech AMC750/AMC751. Chassis such as the VadaTech VT884/VT815 can accept modules with Tongue two connector.

BLOCK DIAGRAM



FRONT PANEL



REFERENCE DESIGN

VadaTech provides several Xilinx based FPGA products. The FPGA products are in two categories; FPGA boards with FMC carriers and FPGA products with high speed ADC and DACs. The FPGA products are designed in various architectures such as AMC modules, PCIe cards and 3U Open VPX.

VadaTech provides a reference design implementation for our FPGAs complete with VHDL source code, documentation and configuration binaries. The reference design focuses on the I/O ring of the FPGA to demonstrate low-level operation of the interconnections between the FPGA and other circuits on the board and/or backplane. It is geared to prove out the hardware for early prototyping, engineering/factory diagnostics and customer acceptance of the hardware, but it does not strive to implement a particular end application. The reference VHDL reduces customer time to develop custom applications, as the code can be easily adapted to meet customer's application requirements.

The reference design allows you to test and validate:

- Base and Fabric channels
- Clocks
- Data transfers
- Memory
- User defined LEDs

Xilinx provides Vivado Design Suite for developing applications on Xilinx based FPGAs. VadaTech provide reference VHDL developed using the Vivado Design Suite for testing basic hardware functionality. The reference VHDL is royalty free to use and modify on VadaTech products but customers are restricted from redistributing the reference code and use of this code for any other purpose.

The reference VHDL is shipped in one or more files based on number of ordering options. Not all ordering option have an impact on the FPGA and a new image is created for those options that have direct impact on the FPGA. Use the correct reference image to test your hardware. For more information, refer to the FPGA reference design manual for your device which can accessed from customer support site along with the reference images.

SUPPORTED SOFTWARE

- Default FPGA image stored in flash memory
- Linux BSP
- Build Scripts
- Device Driver
- Reference application projects for other ordering options

The user may need to develop their own FPGA code or adapt VadaTech reference code to meet their application requirements. The design pre-compiled images make use of hardware evaluation licenses, where necessary, instead of full license. VadaTech does not provide license for the Vivado tool or Xilinx IP cores, please contact Xilinx for more information.

Xilinx also provides System Generator tool for developing Digital Signal Processing (DSP) applications.

[Xilinx Vivado Design Suite](#), [Xilinx System Generator for DSP](#)

SPECIFICATIONS

Architecture		
Physical	Dimensions	Double module, mid-size with full-size option
		Width 5.85" (148.5 mm)
		Depth 7.11" (180.6 mm)
Type	AMC ADC	ADC, up to 4 input channels, quad 28 GSPS or dual 56 GSPS
Standards		
AMC	Type	AMC.0
Module Management	IPMI	IPMI Version 2.0
Configuration		
Power	AMC591	90W (application specific)
Environmental	Temperature	Operating Temperature: -5° to 55° C
		Storage Temperature: -40° to +85° C
	Vibration	1G, 5 to 500 Hz on each axis
	Shock	30Gs each axis
	Relative Humidity	5 to 95 percent, non-condensing
Electrical	DNL/INL	+/- 0.5 LSB, +/- 1.0 LSB
	SNDR	40 dBFS @ Fin = 1 GHz , 36 dBFS @ Fin = 17 GHz
	Output Rate	128 samples x 8-bit @ 437.5 MHz
	Signals	<100 fs rms jitter, <500 fs I/Q sample time error
Front Panel	Interface Connectors	SMPM as differential input for each channel
		SMPM Trig in
		SMPM Clock/Ref input
		IPMI and FPGA RS-232 via micro USB
		FPGA JTAG
	LEDs	IPMI and Debug (user defined) LEDs
	Mechanical	Hot Swap Ejector Handle
Software Support	Operating Systems	Independent
Other		
MTBF		MIL Hand book 217-F @ TBD Hrs
Certifications		Designed to meet FCC, CE and UL certifications where applicable
Standards		VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards
Warranty		Two (2) years

INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of ATCA and μ TCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTM), Power Modules, and more. The company also offers integration services as well as pre-configured Application-Ready Platforms. Please contact VadaTech Sales for more information.

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ORDERING OPTIONS

AMC591 – A0C – 000 – 00J

A = Direct RF Clock synthesis

- 0 = Front panel
- 1 = On board Wide-Band PLL

C = Front Panel

- 1 = Reserved
- 2 = Mid-size
- 3 = Full-size
- 4 = Reserved
- 5 = Mid-size, MTCA.1 (captive screw)
- 6 = Full-size, MTCA.1 (captive screw)

J = Temperature Range and Coating

- 0 = Commercial (–5° to +55° C), No coating
- 1 = Commercial (–5° to +55° C), Humiseal 1A33 Polyurethane
- 2 = Commercial (–5° to +55° C), Humiseal 1B31 Acrylic
- 3 = Industrial (–20° to +70° C), No coating
- 4 = Industrial (–20° to +70° C), Humiseal 1A33 Polyurethane
- 5 = Industrial (–20° to +70° C), Humiseal 1B31 Acrylic

RELATED PRODUCTS



VT815 9U μ TCA.0/4 Chassis
12 AMCs



AMC104 PCIe Gen3
Carrier



AMC750
Xeon Processor

CONTACT US

VadaTech Corporate Office

198 N. Gibson Rd.
Henderson, NV 89014
Email: info@vadatech.com
Telephone: +1 702 896-3337
Fax: +1 702 896-0332

Asia Pacific Sales Office

7 Floor, No. 2, Wenhua Street, Neihu District,
Taipei 114, Taiwan
Email: info@vadatech.com
Telephone: +886-2-2627-7655
Fax: +886-2-2627-7792

VadaTech European Sales Office

VadaTech House, Bulls Copse Road,
Southampton, SO40 9LR
Email: info@vadatech.com
Telephone: +44 2380 016403