

XCalibur5090

Dual Virtex-7 Based Digital Signal Processing 6U LRM FPGA with Quad 2500 MSPS DAC & Dual 3200 MSPS ADC

- ▶ Two AMD (formerly Xilinx) Virtex-7 XC7VX690T FPGAs
- ▶ Up to 1 GB of DDR3 SDRAM per FPGA in two channels
- ▶ Non-volatile FPGA configuration flash
- ▶ 128 MB of user NOR flash per FPGA
- ▶ Conduction-cooled 6U LRM form factor
- ▶ Four 14-bit 2500 MSPS AD9739 DAC
- ▶ Two dual-channel 12-bit 3200 MSPS ADC12D1600RF ADC
- ▶ 234 single-ended FPGA interconnects
- ▶ Eight high-speed serial FPGA interconnects
- ▶ 28 FPGA GPO to the backplane
- ▶ 51 FPGA GPI from the backplane
- ▶ 17 FPGA GPIO to the backplane
- ▶ FPGA Development Kit (FDK)



XCalibur5090

The XCalibur5090 is a high-performance, reconfigurable, conduction-cooled 6U LRM module based on the AMD (formerly Xilinx) Virtex-7 family of FPGAs. With a pair of Virtex-7 FPGA, high-speed serial interfaces, DAC and ADC channels, external memory, and flexible, high-density I/O, the XCalibur5090 is ideal for customizable, high-bandwidth, signal-processing applications.

The XCalibur5090 utilizes four AD9739 and two ADC12D1600RF to provide four channels of high-frequency 14-bit Digital Analog Conversion (DAC) at 2500 Mbps and four channels of 12-bit Analog Digital Conversion (ADC) at 1600 Mbps for high-performance Digital Signal Processing (DSP), which can also be used as two channels at 3200 Mbps.

The XCalibur5090 provides a high-performance, feature-rich solution capable of interfacing to and processing streaming data from a wide variety of sensors. The X-ES FPGA Development Kit (FDK) is provided to support the requirements of high-performance, real-time, embedded streaming data applications and simplify FPGA development. It includes IP blocks, example FPGA designs, and software to control and communicate with FPGAs.

X-ES

Extreme Engineering Solutions

*“Fast, Flexible, Customer-Focused
Embedded Solutions”*

Extreme Engineering Solutions

9901 Silicon Prairie Parkway • Verona, WI 53593
Phone: 608.833.1155 • Fax: 608.827.6171
sales@xes-inc.com • <https://www.xes-inc.com>

FPGA

- Dual AMD (formerly Xilinx) Virtex-7 for high-performance logic and DSP applications
- Up to 1 GB of DDR3 SDRAM per FPGA in two channels
- 128 MB of user NOR flash per FPGA
- x8 GTX interconnect between FPGAs
- 234 single-ended interconnect between FPGA

Supported FPGAs

- Virtex-7 XC7VX690T
- Support for commercial and industrial temperature as well as -1, -2, -3 speed grades

Development Support

- X-ES FPGA Development Kit (FDK)

LRM Backplane I/O

- x1 GTX
- 28 3.3 V CMOS from FPGA
- 51 3.3 V CMOS to FPGA
- 17 3.3 V CMOS GPIO to FPGA
- x1 RF REFCLK input
- x4 RF ADC inputs
- x4 RF DAC outputs

Additional Features

- Debug access connector
- Debug LEDs
- JTAG
- x10 1.8 V GPIO to FPGA

Physical Characteristics

- 6U LRM conduction-cooled form factor
- Dimensions: 233 mm x 164 mm
- 0.8 in. pitch without solder-side cover
- 0.85 in. and 1.0 in. pitch with solder-side cover

Environmental Requirements

Contact factory for appropriate board configuration based on environmental requirements.

- Supported ruggedization levels (see chart below): 1, 3, 5
- Conformal coating available as an ordering option

Power Requirements

- Power will vary based on configuration and usage. Please consult factory.

Ruggedization Level	Level 1	Level 3	Level 5
Cooling Method	Standard Air-Cooled	Rugged Air-Cooled	Conduction-Cooled
Operating Temperature	0 to +55°C ambient †	-40 to +70°C ambient †	-40 to +85°C (board rail surface)
Storage Temperature	-40 to +85°C ambient	-55 to +105°C ambient	-55 to +105°C (maximum)
Vibration	0.002 g ² /Hz (maximum), 5 to 2000 Hz	0.04 g ² /Hz (maximum), 5 to 2000 Hz	0.1 g ² /Hz (maximum), 5 to 2000 Hz
Shock	20 g, 11 ms sawtooth	30 g, 11 ms sawtooth	40 g, 11 ms sawtooth
Humidity	Up to 95% non-condensing	Up to 95% non-condensing	Up to 95% non-condensing

† Contact factory for airflow rate details.

