GX3800e

FPGA / FMC PXIE HIGH-PERFORMANCE DIGITAL I/O CARD

- User configurable, on-board Altera Cyclone V GX FPGA
- No proprietary FPGA design tools required
- Accepts 400 pin, VITA 57.1 FMC modules for user specific applications
- Gen 2, x4 PXI Express interface & integral DMA controller supports data streaming rates of up to 800 MB/s
- 3.125 Gbs xcvr I/O

DESCRIPTION

The GX3800e is a user configurable, FPGA-based, 3U PXI Express card which supports the 400 pin, VITA 57.1 FMC interface standard. The card employs the Altera Cyclone V GX FPGA, which supports xcvr data rates up to 3.125 Gb/s and features over 300,000 logic elements and 12.2 Kb of memory.   Users can design their own custom interface module or select from a wide range of commercial off the shelf FMC modules which can then be integrated with the GX3800e - creating customized instrumentation for analog or digital test applications.   The design of the FPGA is done by using Altera's Quartus or the license free Quartus Prime Lite tool set.

FEATURES

The GX3800e's 400 pin FMC interface features 80 differential pairs, 4 differential clocks, (10) 3.125 Gbs xcvrs, two xcvr clocks, an I2C control interface, JTAG bus, and power / gnd connections. The FPGA device supports up to eight phase lock loops for clock synthesis, clock generation and for support of the I/O interface. Additional module resources include:
- 64M x 32 of DDR memory
- 32M x 16 of flash memory (for defined core functions)
- Programmable clock generators
- DMA controller

The module has access to all of the PXI Express bus resources including the PXI 10 MHz clock, PXIe 100 MHz clock, PXIe Sync100, PXIe DStar triggers, the local bus, and the PXI triggers; allowing the user to create a custom instrument which incorporates all of the PXI Express bus resources.

Control and access to the FPGA is provided via the GX3800e's driver which includes DMA and interrupt support, tools for downloading the compiled FPGA code, and register read and write functionality. The GX3800e's unique architecture partitions the PCIe interface separately from the user FPGA - eliminating the need for the user to incorporate the PCIe interface as part of his or her overall FPGA design. Access to the user FPGA is via an internal address and data bus with predefined registers which are supported by the module's software driver and an interactive UI. The result is a simplified design / integration process since both the PCIe bus interface and associated software driver are known, tested entities.

PROGRAMMING AND SOFTWARE

The board is supplied with the GXFPGA library, a software package that includes a virtual instrument panel, and a Windows 32/64-bit DLL driver library and documentation. The virtual panel can be used to interactively program and control the instrument from a window that displays the instrument's current settings and status. In addition, interface files are provided to support access to programming tools and languages such as ATEasy®, LabVIEW, LabVIEW/Real-Time, C/C++, Microsoft Visual Basic®, Delphi, and Pascal. An On-Line help file and PDF User's Guide provides documentation that includes instructions for installing, using and programming the board. Once the user has compiled the FPGA design, the configuration file can be loaded directly into the FPGA or via on-board flash memory.

A separate software package - GtLinux - provides support for Linux 32/64 operating systems.

APPLICATIONS

- Automatic Test Equipment (ATE)
- Semiconductor test
- Custom interface emulation
- Custom instrumentation
- SerDes interfaces

FPGA

GX3800e

SPECIFICATIONS

EXTERNAL DIGITAL I/O	
400 Pin, VITA 57.1 Interface	80 Diff I/O (10) 3.125 Gbs xcvrs 2 xcvr clocks 4 diff clocks I2C bus JTAG bus GA0,GA1
FMC I/O Connector	Samtec ASP-134486-01 (HPC)
Mating FMC I/O Connector (mezzanine side)	Sametc ASP-134602-01 (HPC)

TIMING SOURCES	
PXIe Bus	10 MHz, 100 MHz
Internal	100 MHz clock (nominal), programmable

FPGA AND MEMORY	
FPGA Type	Altera Cyclone V GX, 5CGXFC9E6F35C7N
Number of PLLs	Eight
Logic Elements	301 K
Internal Memory	12,200 Kb
On-Board Memory	64 M x 32 DDR3
On-Board Flash	32M x 16

POWER	
3.3 VDC	5.2 A (max)
12 VDC	4 A (max)
FMC Interface	Vadj, VIO, VRefA, VRefB, 3.3V, 3.3VAux 12V

ENVIRONMENTAL	
Operating Temperature	0 °C to +50 °C
Storage Temperature	-20 °C to +70 °C
Size	3U PXI
Weight	200 g

Note: Specifications are subject to change without notice

ORDERING INFORMATION

GX3800e	3U PXIe High-Performance FPGA / FMC I/O Board