proFPGA
Speed meets Flexibility

quad SG-280 Prototyping System

Product Summary

The proFPGA quad SG-280 system is a complete and modular multi-FPGA solution, which meets highest requirements in the area of FPGA based Prototyping. It addresses customers who need a scalable and flexible high speed ASIC Prototyping solution for early software development and real time system verification. The innovative system concept offers highest flexibility and reusability reconfigurability for several projects, which guarantees the best return on investment.

Highest Flexibility

The system architecture is based on a modular and scalable single-chip concept. The FPGAs are assembled on dedicated FPGA modules, which will be plugged on the proFPGA uno, duo or quad motherboard. This offers the highest flexibility to use for example different FPGA types in one system or to scale a system in increments of one FPGA. The user has access to almost all I/Os of the FPGA, which gives him maximum freedom regarding the FPGA interconnection structure. This way the prototyping system can be adapted in the best way to any user design. Furthermore the system offers a total of 32 extension sites on the top and bottom site for standard or user specific extension boards like DDR4 memory, PCIe gen1/2/3, Gigabit Ethernet, USB 3.0 or other high speed interface and interconnect boards.

Maximum Performance

The well designed boards of the proFPGA system are optimized and trimmed to guarantee best signal integrity and to achieve highest performance. The high speed boards together with specific high speed connectors allow a maximum point-to-point speed of up to 1.0 Gbps single ended over the standard FPGA I/Os and up to 17.4 Gbps differential over the high speed serial transceivers of the FPGA. This performance combined with the high interconnection flexibility allows the designer to run his design at the highest possible speed on the proFPGA system.

Biggest Capacity

Equipped with up to four Intel® Stratix® 10 FPGA modules, the proFPGA quad system can handle up to 80 M ASIC gates on only one board. Due to the fact, that multiple proFPGA quad or duo systems can be connected to even larger systems, there is an unlimited scalability and no theoretical maximum in capacity.

Very User Friendly

The proFPGA prototyping system provides an extensive set of features and tools, like remote system configuration, integrated self and performance test, automatic board detection, automatic I/O voltage programming, system scan and safety mechanism, which simplifies the usage of the FPGA based system tremendously.

(intel) **Stratix**®
FPGA·SoC
ALTERA®

SST Smart Stacking Technology
FMT FPGA Mixing Technology
DMBI Device Message Box Interface
ACM Advanced Clock Management

Key Features

- 80 M ASIC gates capacity on one board
- 4104 user I/Os
- 96 dedicated high speed serial transceivers
- 32 individually adjustable voltage regions
- Up to 1.0 Gbps single ended point-to-point speed
- proFPGA FPGA Mixing Technology (FMT)
- Smart Stacking Technology (SST)
- High performance host interface (DMBI)
- Advanced Clock Management (ACM)

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Innovative Technologies

SST
Smart Stacking Technology

Smart Stacking Technology

- Board detection when boards are plugged
- Automatic and right I/O voltage setting and programming with conflict detection
- Integrated interconnection self and performance test
- Smart I/O resource management. No I/O resources get lost or blocked by connectors

FMT
FPGA Mixing Technology

FPGA Mixing Technology

- Easy plugging and unplugging of FPGA modules on motherboards
- Various FPGAs from different vendors can be mixed
- Automatic scan and detection of FPGA modules, when plugged
- Different FPGA configurations are controlled by proFPGA Builder Software

DMBI
Device Message Box Interface

Device Message Box Interface

- High speed, low latency data exchange system
- Enables various use modes and functionalities like remote system configuration and monitoring, de bug, application level program- ming and co-simulation
- Up to 3.5 Gbps data transfer rate
- Runs over USB, Ethernet or PCIe

ACM
Advanced Clock Management

Advanced Clock Management

- Run-time configurable local clocks
- Each clock with sync signals
- 6 global clock and sync signals per motherboard

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profpga quad SG-280 Specification

FPGAs	- 4 x Intel Stratix 10 SG-280 FPGA Modules
Capacity	- Up to 80 M ASIC gates (20 M ASIC gates per FPGA Module)
FPGA-internal memory	- Up to 916 Mbit on one board (229 Mbit per FPGA Module)
Signaling rate	- Up to 1.0 Gbps (standard I/O)/ up to 17.4 Gbps
Extension sites	- Up to 24 Extension sites with high speed connectors

I/O resources	- Overall 4104 signals
	  - 1026 free I/Os per FPGA Module
	    - 4x141 I/Os to top side connectors
	    - 3x141 and 1 x 39 I/Os to bottom side connectors

High speed I/O transceivers	- Overall 96 high speed transcievers on top and bottom side
	  - 24 transceivers (12.5 Gbps) per FPGA Module
	    - 1 x 12 and 2 x 6 transceivers to top side connectors

FPGAs interconnections	- Flexible via high-speed interconnection boards or cables

Voltage regions	- 32 individually adjustable I/O voltage regions
	  - 8 individually adjustable voltage regions per FPGA Module
	  - Stepless from 1.2V up 1.8V
	  - Automated detection of daughter cards and setting of right voltages

Clocking	- 216 differential external clock inputs
	  - 54differential clock inputs per FPGA Module
	  - 6 differential clock inputs per connector
	- Run-time configurable local clocks
	  - 6 global clock and sync signal inputs per motherboard
	  - Fully synchronous derived clocks with sync signals

Configuration	- With host software via Ethernet, USB, PCIe or Xilinx JTAG interface
Data exchange	- On board DMBI (Device Message Box Interface) - Data exchange rate: - Ethernet (up to 100 Mbps), USB (480 Mbps), PCIe (up to 3.5 Gbps)
Power	External (optional) ATX Power Supply (12 V, 24 - 35 A output)
Dimensions	- 11.81" x 0.95" x 12.20" / 300 mm x 24 mm x 310 mm (width x height x depth) - 2.5 kg weight

profpga quad SG-280 I/O and Clock Architecture