



DIGITAL INDUSTRIES SOFTWARE

Veloce proFPGA - Extension Boards and Cables

Add-on boards, memory and cables for specific debug and development requirements.

Benefits

- Customized FPGA Modules
- Development of high-tech and high-quality products
- PCB design and layout of complex boards, devices and systems
- Production and assembly of prototypes, small and medium-sized series (up to 10,000 pieces per year)
- ProFPGA prototyping systems and solutions

Summary

The proFPGA product family is a complete, scalable, and modular multi FPGA solution, which fulfills highest needs in the area of FPGA based Prototyping. Because of its modular and scalable system architecture, the user has maximum flexibility and reusability. Siemens offers a number of add-on board extensions and cables for the Veloce proFPGA platform and FPGA boards for debug situations that require additional memory, peripherals, and extension cables.

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Veloce proFPGA Riser Interconnect Board

Technical Highlights

- Length matched high-speed interconnectboard
- Lifts height
- Provides a proFPGA Bottom and a proFPGA Top Connector
- 1to1 Connection of proFPGA Extension Site
- Up to 5 Riser-Boards can be plugged on top of each other



Overview

The proFPGA Riser Interconnect Board provides a proFPGA Bottom and a proFPGA Top Connector. It is used wherever due to height incompatibility two different extension boards cannot be plugged on-top of each other.

Connectors	one proFPGA Bottom Connector, one proFPGA Top Connector
Feature	Up to 5 Riser-Boards can be plugged on top of each other
Others	I ² C subsystem including I ² C IDPROM, I ² C multiplexer and I ² C GPIO expander
Supported Veloce proFPGA FPGA Modules	Any
Product Article Number	PROF056 EB-PDFS-RISER-R1
Order code	286464

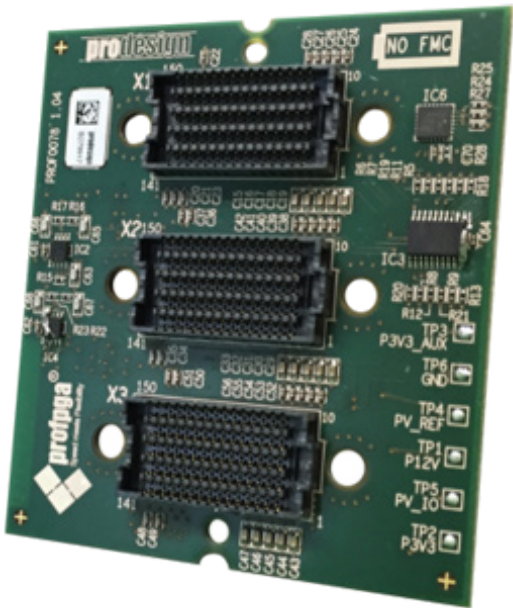
Veloce proFPGA Breakout Interconnect Board

Technical Highlights

- Spreads 1 Connector to 3 proFPGA-V1-Connectors
- One proFPGA-Bottom Connector
- Three proFPGA-V1-Top Connectors (X1,X2,X3)
- Provides P12, P3V3, P3V3_AUX, PV_REF and PV_IO
- Connectors provide individual the FPGA I2C control bus

Overview

The proFPGA Breakout board provides the ability to spread a single proFPGA-Connector up to three proFPGA-V1-Connectors.



Connectors	one proFPGA Bottom Connector, three proFPGA-V1-Top Connectors (X1,X2,X3)
Number of IOs	UThe proFPGA-V1-Top Connectors provides a different number of I/Os X1: 47 I/Os and 8 Clock-I/Os X2: 47 I/Os and 8 Clock-I/Os X3: 46 I/Os and 8 Clock-I/Os
Others	I ² C subsystem including I ² C IDPROM, I ² C multiplexer and I ² C GPIO expander
Supported Veloce proFPGA FPGA Modules	Any
Product Article Number	PROF078 EB-PDS-BREAKOUT-R1
Order code	286742

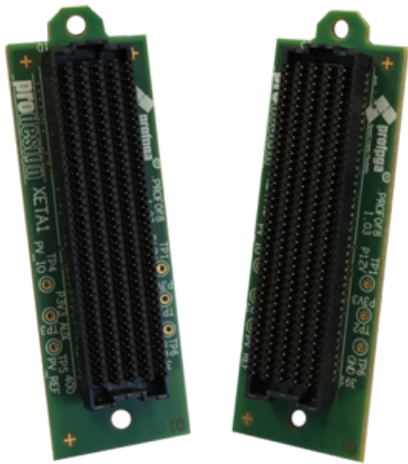
Veloce proFPGA TA1V1/TA2V1 Adapter Board

Technical Highlights

- Converts the proFPGA V1 to proFPGA V0 connectors
- One regular proFPGA-Top V0 Connector
- One proFPGA-V1-Bottom Connector
- Fits on proFPGA FM-XCVU440 FPGA modules
- 51 IOs on TA1V1 and 52 IOs on TA2V1

Overview

The adapter board kit consists of two boards which allow to convert the proFPGA V1 connectors on the FM-XCVU400 FPGA modules to regular proFPGA V0 connectors. One of the two board is dedicated to the TA1V1 connector and the second board is dedicated to the TA2V1 connector.



Connectors	one regular proFPGA V0 Top Connector ,one proFPGA V1 Bottom Connector
Supported proFPGA FPGA Modules	FM-XCVU440
Number of IOs	51 IOs and CLK_IOs are connected to TA1V1 and 52 IOs and CLK_IOs to TA1V2
Others	I ² C subsystem including I ² C IDPROM
Supported Veloce proFPGA FPGA Modules	Any
Product Article Number	PROF068 EB-FM-XCVU440-R1
Order code	286470

Veloce proFPGA Interconnect Cable

Technical Highlights

- Length matched high-speed interconnect cable
- Connects any extension sites (all directions)
- Creates a bus between two extension site connectors
- Connects up to 147 I/Os (three I/O banks), 16 clock I/Os
- Maximum point to point performance

Overview

The proFPGA Interconnect Cable connects any 2 extension site connectors of the proFPGA system together. Over the length matched high-performance cables up to 147 I/Os can be connected with a maximum point to point performance depending on the used FPGA type. The board can be used with single ended and differential connections. It is available in 400 mm or 800 mm length.



IO	131
Clock IO	16
Performance	Maximum point to point performance depending on the used FPGA type
Others	Equipped with ID chip for automatic board recognition via proFPGA motherboard
Supported Veloce proFPGA FPGA Modules	Any
Product article number	IC-PDS-CABLE-R1
Order code	286461 (40cm) 286462 (80cm) 286467 (120cm) 286468 (160cm) 286469 (200cm)

Veloce proFPGA Interconnect Cable (70pin)

Technical Highlights

- Length matched high-speed interconnect cable
- Connects any extension sites (all directions)
- Creates a bus between two extension site connectors
- Connects up to 52 I/Os (one I/O banks), 8 clock I/Os
- Maximum point to point performance

Overview

The proFPGA Interconnect Cable connects any 2 extension site connectors of the proFPGA system together. Over the length matched high-performance cables up to 52 I/Os can be connected with a maximum point to point performance depending on the used FPGA type. The board can be used with single ended and differential connections. It is available in 400 mm or 800 mm length.



IO	up 52
Clock IO	8
Performance	Maximum point to point performance depending on the used FPGA type
Others	Equipped with ID chip for automatic board recognition via proFPGA motherboard
Supported Veloce proFPGA FPGA Modules	Any
Product article number	IC-PDS-CABLE-R2/R3
Order code	286465 (40cm) 286466 (80cm)

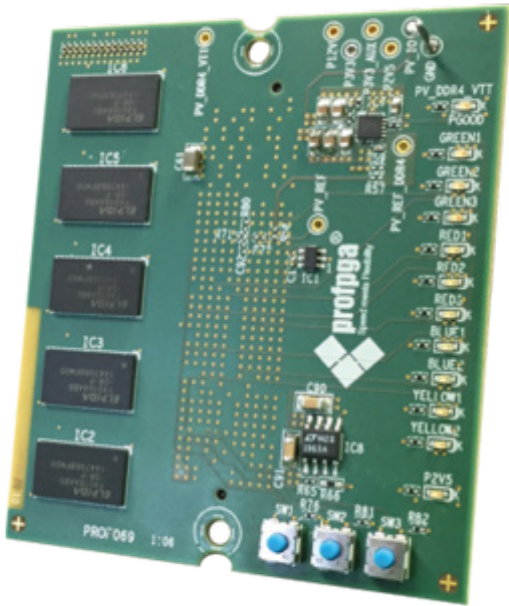
Veloce proFPGA DDR4 2.5GB SDRAM Board

Technical Highlights

- 2.5 GByte of DDR4-2400 memory
- Assembled with 5x Micron EDY4016AABG-DR-F-D chips
- Including programmable clock generator
- Data rate up to 2400 Mbps
- Three push-buttons and 8 user LEDs

Overview

This daughter board occupies one extension site of the proFPGA system and offers up to 2.5 GB DDR4 SDRAM memory and can be accessed over a 80bit databus. Due to the length matched board design, the daughter boards can be used with performances of up to 2400 Mbps. Besides the board offers three push-buttons and 8 on board LEDs, which can we used for debugging purpose.



Memory Modules	5X Micron EDY4016AABG-DR-F-D chips
Capacity	2.5 GB
Data rate/Databus	Up to 2400 Mbps/ 80bit
Clocking	programmable clock generator to create a clock for the memory generator
Others	Equipped with 8 LEDs, 3 x push-buttons and ID chip for automatic board recognition
Supported Veloce proFPGA FPGA Modules	Veloce proFPGA AMD® UltraScale™ VCU440 Module Veloce proFPGA AMD® UltraScale™ XCKU115 Module Veloce proFPGA AMD® UltraScale+™ XCVU37P Module Veloce proFPGA AMD® UltraScale+™ XCVU19P Module Veloce proFPGA AMD® UltraScale+™ XCVU13P Module Veloce proFPGA AMD® UltraScale+™ XCVU9P Module Veloce proFPGA AMD® Zynq™ UltraScale+™ ZU19EG Module
Product article number	PROF069 EB-PDS-DDR4-R2/R3
Order code	286472

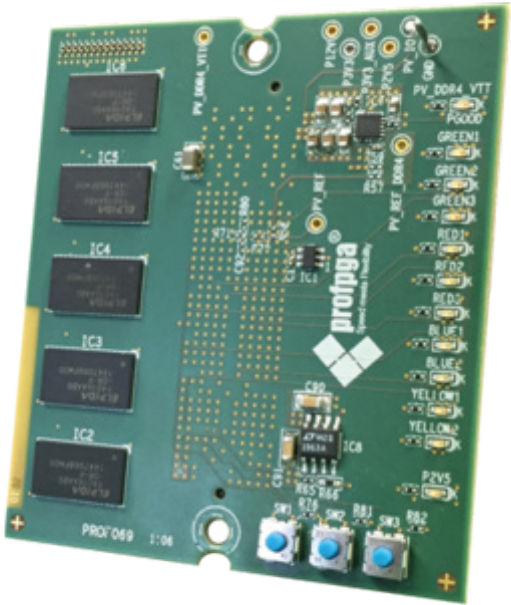
Veloce proFPGA DDR4 5GB SDRAM Board

Technical Highlights

- 5 GByte of DDR4-2400 memory
- Assembled with 5x Micron MT40A512M16HA-083E chips
- Including programmable clock generator
- Data rate up to 2400 Mbps
- Three push-buttons and 8 user LEDs

Overview

This daughter board occupies one extension site of the proFPGA system and offers 5 GByte DDR4 SDRAM memory and can be accessed over a 80bit databus. Due to the length matched board design, the daughter boards can be used with performances of up to 2400 Mbps. Besides the board offers three push-buttons and 8 on board LEDs, which can we used for debugging purpose.



Memory Modules	5X Micron MT40A512M16HA-083E chips
Capacity	5 GB
Data rate/Databus	Up to 2400 Mbps/ 80bit
Clocking	programmable clock generator to create a clock for the memory generator
Others	Equipped with 8 LEDs, 3 x push-buttons and ID chip for automatic board recognition
Supported Veloce proFPGA FPGA Modules	Veloce proFPGA AMD® UltraScale™ VCU440 Module Veloce proFPGA AMD® UltraScale™ XCKU115 Module Veloce proFPGA AMD® UltraScale+™ XCVU37P Module Veloce proFPGA AMD® UltraScale+™ XCVU19P Module Veloce proFPGA AMD® UltraScale+™ XCVU13P Module Veloce proFPGA AMD® UltraScale+™ XCVU9P Module Veloce proFPGA AMD® Zynq™ UltraScale+™ ZU19EG Module
Product article number	PROF069 EB-PDS-DDR4-R6
Order code	289460

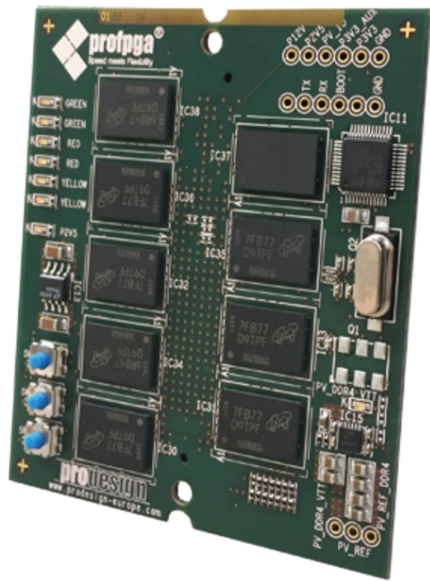
Veloce proFPGA DDR4 18GB SDRAM Board

Technical Highlights

- 18 GByte of DDR4-2400 memory
- Assembled with 9 x Micron MT40A2G8FSE-083E chips
- Including programmable clock generator
- Data rate up to 526 MHz (1052 MT/s).
- Three push-buttons and 6 user LEDs

Overview

This daughter board occupies one extension site of the proFPGA system and offers up to 9 GB DDR4 SDRAM memory and can be accessed over a 72bit databus. Due to the length matched board design, the daughter boards can be used with performances of up to 526 MHz (1052 MT/s). Besides the board offers three push-buttons and 8 on board LEDs, which can we used for debugging purpose.



Memory Modules	9x Micron MT40A2G8FSE-083E chips
Capacity	18 GB
Data rate/Databus	Up to to 526 MHz (1052 MT/s)/ 72bit
Clocking	programmable clock generator to create a clock for the memory generator
Others	Equipped with 6 LEDs, 3 x push-buttons and ID chip for automatic board recognition
Supported Veloce proFPGA FPGA Modules	Veloce proFPGA AMD® UltraScale™ VCU440 Module Veloce proFPGA AMD® UltraScale™ XCKU115 Module Veloce proFPGA AMD® UltraScale+™ XCVU37P Module Veloce proFPGA AMD® UltraScale+™ XCVU19P Module Veloce proFPGA AMD® UltraScale+™ XCVU13P Module Veloce proFPGA AMD® UltraScale+™ XCVU9P Module Veloce proFPGA AMD® Zynq™ UltraScale+™ ZU19EG Module
Product article number	PROF105A EB-PDS-DDR4-R5
Order code	286473

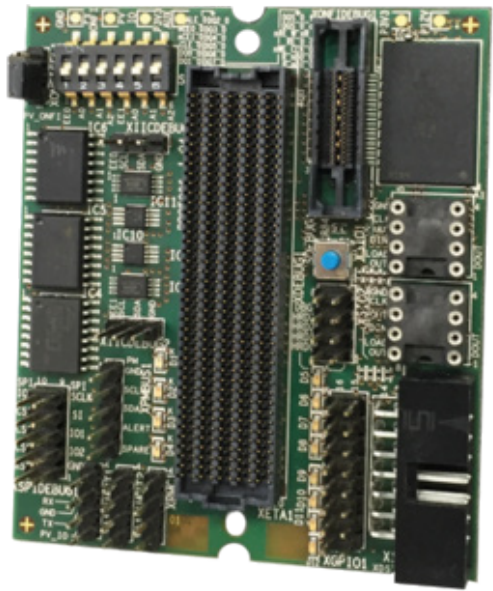
Veloce proFPGA ONFI Flash Board

Technical Highlights

- 128 Gbit ONFI Flash: MT29F128G08AMCDBJ5-6 or
256 Gbit ONFI Flash: MT29F256G08CBCBBJ4-37
- 512 Mbit quad SPI flash (S25FL512SAGMFI011)
- 1 Mbit NVSRAM (CY14V101Q3)
- 1 Mbit quad SPI MRAM (MR10Q010SC)
- Debug interface with 38-pin MICTOR connector

Overview

This daughter board occupies one extension site of the proFPGA system and offers 128 Gbit or 256 Gbit ONFI flash, 512 Mbit quad SPI flash, 1 Mbit NVSRAM, 1 Mbit quad SPI MRAM, Debug interface for ONFI flash with 38-pin MICTOR connector, debug interface for all SPI signals of all SPI devices, 2 x I²C 64 kbit EEPROMs, 1 x debug interface for each I²C EEPROM, I²C EEPROM address selection via DIP switch, 1 x A15 Dstream connector, 1 x PMBus header, 3 x UART headers, 1 x heartbeat LED, 3 x debug LEDs, 1 x push button, debug header with 4 IO signals connected with pull-ups and the possibility to assemble jumpers to set a low input signal and a debug header with 8 IO signals connected with pull-ups, the possibility to assemble pull-downs and the possibility to assemble jumpers to set a low input signal. Additionally green LEDs are connected to each GPIO line.



Memory Modules	128Gbit: MT29F128G08AMCDBJ5-6 (proFPGA ONFI Flash Board) or 256 Gbit: MT29F256G08CBCBBJ4-37 (proFPGA ONFI2 Flash Board) 512 Mbit quad SPI flash (S25FL512SAGMFI011) 1 Mbit NVSRAM (CY14V101Q3) 1 Mbit quad SPI MRAM (MR10Q010SC)
Debug Interface	Debug interface for ONFI flash with 38-pin MICTOR connector Debug interface for all SPI signals of all SPI devices Debug interface for each I ² C EEPROM 3 x debug LEDs Debug header with 4 IO signals Debug header with 8 IO signals Green LEDs are connected to each GPIO line.
Others	2 x I ² C 64 kbit EEPROMs (AT24C64D-XHM-T) I ² C EEPROM address selection via DIP switch 1 x A15 Dstream connector 1 x PMBus header 3 x UART headers 1 x heartbeat LED 1 x push button for user usage
Supported Veloce proFPGA FPGA Modules	
Product article number	PROF086B EB-PDS-FLASH-R1 (proFPGA ONFI Flash Board) or PROF086B EB-PDS-FLASH-R2 (proFPGA ONFI2 Flash Board)
Order code	289760

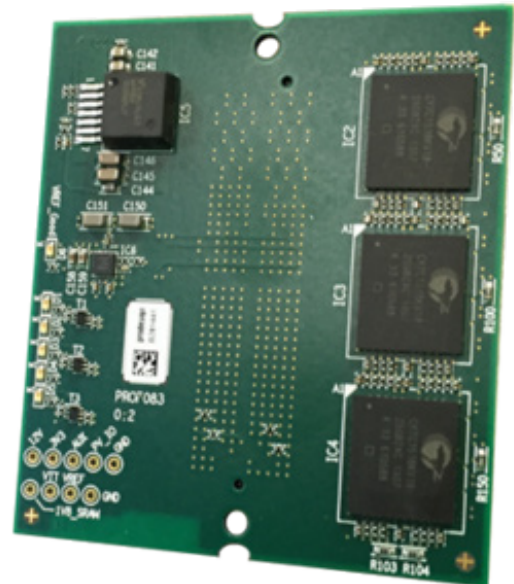
Veloce proFPGA SRAM Board

Technical Highlights

- 72 or 144 Mbit memory depth per SRAM
- Assembled with 3 x CY7C1518KV18-250BZXC or CY7C1618KV18SRAM memory chips
- 54 bit (18 bit per SRAM) wide databus
- 250 MHz or 333 MHz (depending on SRAM type)
- 5 Debugging LEDs

Overview

This daughter board occupies one extension site of the proFPGA system and offers up to 144 Mbit memory depth per SRAM accessed over a 18 bit databus. The proFPGA SRAM Board is available in two different configurations. EB-PDS-SRAM-R1: 3x CY7C1618KV18-250BZXC (500MBit/s), EB-PDS-SRAM-R2: 3x CY7C1618KV18-333BZXC (666MBit/s). Depending on the used SRAM type you can run with 250 MHz or 333 MHz. Further the board offers 5 LEDs for debugging.



SRAM Memory Types	EB-PDS-SRAM-R1: 3x CY7C1618KV18-250BZXC (500MBit/s) EB-PDS-SRAM-R3: 3x CY7C1618KV18-333BZXC (666MBit/s)
Capacity	72 or 144 Mbit memory depth per SRAM
Frequency	250 MHz or 333 MHz (depending on SRAM type)
Databus	54 bit (18 bit per SRAM)
Others	5 LEDs for debugging and ID chip for automatic board recognition
Supported Veloce proFPGA FPGA Modules	Veloce proFPGA AMD® Virtex-7™ XC7V2000T Module Veloce proFPGA AMD® UltraScale™ VCU440 Module Veloce proFPGA AMD® UltraScale™ XCKU115 Module Veloce proFPGA AMD® UltraScale+™ XCVU37P Module Veloce proFPGA AMD® UltraScale+™ XCVU19P Module Veloce proFPGA AMD® UltraScale+™ XCVU13P Module Veloce proFPGA AMD® UltraScale+™ XCVU9P Module Veloce proFPGA AMD® Zynq™ UltraScale+™ ZU19EG Module
Product article number	PROF083 EB-PDS-SRAM-R1/R2
Order code	286491 (216Mb) 286488 (432Mb)

Veloce proFPGA DDR3 1GB SDRAM Board

Technical Highlights

- up to 1GB DDR3 SDRAM
- Assembled with 4 x 2 or 4 Gb DDR-1600 modules
- 64 bit wide databus
- Data rate up to 1600 Mbps
- Length matched board design offering highest performance

Overview

This daughter board occupies one extension site of the proFPGA system and offers up to 1GB DDR3 SDRAM memory and can be accessed over a 64bit databus. Due to the length matched board design, the daughter boards can be used with performances of up to 1600 Mbps. Besides the board offers 16 on board LEDs, which can we used for debugging purpose.



Memory Modules	4 x 2Gb or 4Gb DDR3-1600 1
Capacity	2 GB (with 2 Gb modules) or 1 GB (with 1 Gb modules)
Data rate	Up to 1600 Mbps
Databus	64 bit
Others	Equipped with 16 LEDs and ID chip for automatic board recognition via proFPGA motherboard
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF27 EB-PDS-DDR3-R2
Order code	286478

Veloce proFPGA DDR3 2GB SDRAM Board

Technical Highlights

- up to 2GB DDR3 SDRAM
- Assembled with 4 x 2 or 4 Gb DDR-1600 modules
- 64 bit wide databus
- Data rate up to 1600 Mbps
- Length matched board design offering highest performance

Overview

This daughter board occupies one extension site of the proFPGA system and offers up to 2GB DDR3 SDRAM memory and can be accessed over a 64bit databus. Due to the length matched board design, the daughter boards can be used with performances of up to 1600 Mbps. Besides the board offers 16 on board LEDs, which can we used for debugging purpose.



Memory Modules	4 x 2Gb or 4Gb DDR3-1600 1
Capacity	2 GB (with 2 Gb modules) or 1 GB (with 1 Gb modules)
Data rate	Up to 1600 Mbps
Databus	64 bit
Others	Equipped with 16 LEDs and ID chip for automatic board recognition via proFPGA motherboard
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF27 EB-PDS-DDR3-R2
Order code	286479

Veloce proFPGA DDR3 4GB SDRAM Board

Technical Highlights

- up to 4GB DDR3-1600 memory
- Assembled with 4x Micron MT41K512M16TNA-125 chips
- 64 bit wide databus
- Data rate up to 750 Mbps (with Xilinx MIG)
- Length matched board design offering highest performance

Overview

This daughter board occupies one extension site of the proFPGA system and offers up to 4GB DDR3 SDRAM memory and can be accessed over a 64bit databus. Due to the length matched board design, the daughter boards can be used with performances of up to 750 Mbps (with Xilinx MIG). Besides the board offers 16 on board LEDs, which can be used for debugging purpose.



Memory Modules	4x Micron MT41K512M16TNA-125
Capacity	4 GB
Data rate	up to 750 Mbps (with Xilinx MIG)
Databus	64 bit
Others	Equipped with 16 LEDs and ID chip for automatic board recognition via proFPGA motherboard
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF27 EB-PDS-DDR3-R3
Order code	286481

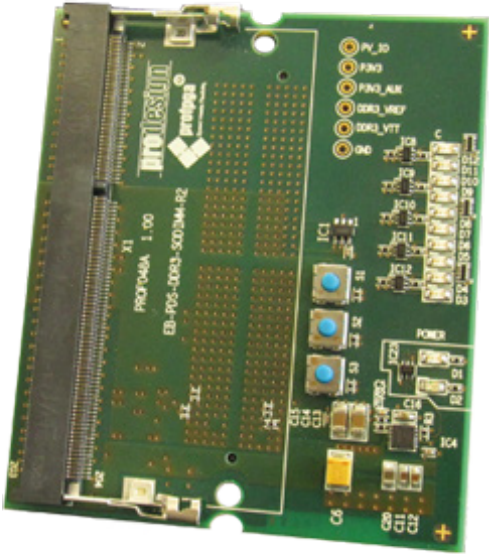
Veloce proFPGA DDR3 SO-DIMM Adapter Board

Technical Highlights

- SO-DIMM socket for DDR3 memory modules
- Three push-buttons with user definable function
- Ten user LEDs
- Data rate up to 650 Mbps
- Length matched board design offering highest performance

Overview

This adapter board occupies one extension site of the proFPGA system and offers a SO-DIMM socket for standard DDR3 memory modules. Due to the length matched board design, the daughter boards can be used with performances of up to 650 Mbps. Besides the board offers 10 user LEDs, which can we used for debugging purpose.



Memory Modules	Standard DDR3 SO-DIMM compatible memory modules
Capacity	Depending on used memory modules
Data rate	Up to 650 Mbps
IO voltage	1.5 V
Others	Equipped with 3 push buttons, 10 LEDs and ID chip for automatic board recognition
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF48a EB-PDS-DDR3-SODIMM-R2
Order code	286477

Veloce proFPGA LPDDR4 Board

Technical Highlights

- 0.5 GByte LPDDR4-800 memory
- 2x two GBit Winbond W97BH2KBQX devices
- Data rate up to 800 Mbps
- 2x SoftTouch Connectors
- 3x push-buttons and 16 user LEDs

Overview

This daughter board occupies one extension site of the proFPGA system and offers 2x two GBit Winbond W97BH2KBQX memory devices which can be accessed over a 32bit databus. Due to the length matched board design, the daughter boards can be used with performances of up to 800 Mbps. Besides the board offers three push-buttons, 16 on board LEDs and 2 SoftTouch connectors, which can we used for debugging purpose.



Memory Modules	2x two GBit Winbond W97BH2KBQX devices
Capacity	0.5 GB
Data Rate	Up to 800 Mbps
Memory organization	32 bit x 64M
Others	Equipped with 16 LEDs, 3 x push-buttons and 2 SoftTouch connectors
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF084 EB-PDS-LPDDR4-R1
Order code	286484

Veloce proFPGA Multi-Memory Board

Technical Highlights

- 3 different types of memory with debug opportunities
- 16 Mbit SRAM, 256 Kbit MRAM, 512 Mb NOR Flash
- 2x MICTOR Connectors for debugging
- 4x 1.8V GPIO-Pins
- 2x push-buttons and 4 user LEDs

Overview

This daughter board occupies one extension site of the proFPGA system and provides 3 different types of memory with several debug opportunities like: 16 Mbit SRAM (CY62167EV18), 256 Kbit MRAM (MR256D08B), 512 Mb NOR Flash (JS28F512M29EWHA), 2x Buttons for debugging, 4x LEDs (green, red, yellow, blue) for debugging, 4x 1.8V GPIO-Pins for debugging, 2x MICTOR Connectors for debugging, DIP-SWITCH for changing Pull-Ups and -Downs for some address-pins and level shifters for operating independent from PVIO.



Memory Type SRAM	16 Mbit SRAM (CY62167EV18)
Memory type MRAM	256 Kbit MRAM (MR256D08B)
Memory type NOR Flash	512 Mb NOR Flash (JS28F512M29EWHA)
Interfaces	2x MICTOR Connectors; 4x 1.8V GPIO-Pins
Others	4 LEDs, 2 x push-buttons, DIP-SWITCH for changing Pull-Ups and -Downs
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF095 EB-PDS-MULTIMEMORY-R1
Order code	286490

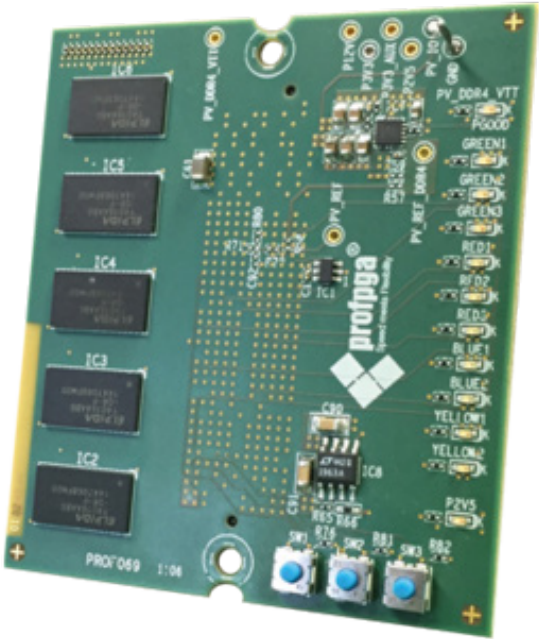
Veloce proFPGA Stratix 10 DDR4 4GB Board

Technical Highlights

- 4 GByte of DDR4-2400 memory
- Assembled with 4x Micron MT40A512M16HA-083E chips
- Including programmable clock generator
- Data rate up to 2400 Mbit/s
- Three push-buttons and 12 user LEDs

Overview

This daughter board occupies one extension site of the proFPGA system and offers 4 GByte DDR4 memory and can be accessed over a 64 bit databus. Due to the length matched board design, the daughter boards can be used with performances of up to 2400 Mbit/s. Besides the board offers three push-buttons and 12 on board LEDs, which can we used for debugging purpose.



Memory Modules	4x Micron MT40A512M16HA-083E chips
Capacity	4 GB
Data rate/Databus	Up to 2400 Mbit/s / 64bit
Clocking	programmable clock generator to create a clock for the memory generator (optimized to meet the Intel EMIF IP requirements)
Others	Equipped with 12 LEDs, 3 x push-buttons and ID chip for automatic board recognition
Supported Veloce proFPGA FPGA Modules	Veloce proFPGA Intel® Stratix® 10 GX 10M Module Veloce proFPGA Intel® Stratix® 10 GX2800 Module
Product article number	PROF123A EB-PDS-DDR4-R8
Order Code	286474

Veloce proFPGA Adapter for Juno ARM

Technical Highlights

- Connects proFPGA with Juno ARM Development Platform
- Works with proFPGA uno, duo and quad system
- Full usage of ARM Juno tools and features
- Expands the capacity of Juno ARM Development Platform
- Easy and quick assembly and setup

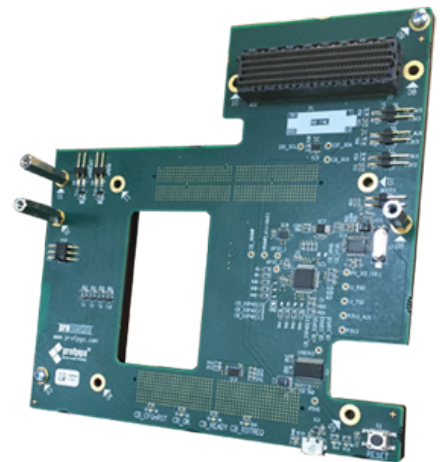


Overview

The Juno ARM Development Platform is a software development platform for ARMv8-A. It includes the Juno Versatile Express board and an ARMv8-A reference software port available through Linaro. The Juno hardware provides software developers with an open, vendor-neutral ARMv8 development platform with ARM Cortex®-A57 and Cortex-A53 MPCore for ARMv8-A big.LITTLE, ARM Mali-T624 GPU for 3D Graphics Acceleration and GP-GPU compute, 4 lane Gen 2.0 PCI-Express and SoC architecture, aligned with Level 1 (Server) Base System Architecture. The platform is a one-stop shopping product for anyone needing to test, prototype, or design a 64-bit product for the ARM ecosystem.

By combining these two powerful platforms in one system, the user can benefit from all the features and tools of the Juno Platform together with the scalable capacity offered by the proFPGA prototyping platform. This way the user has maximum flexibility to design and verify either IP, sub-systems or even complete ARM based SoC designs.

This solution is supported by all ARM Juno variants and an example Application Note AN499 is available as a starting point for an FPGA design implementation. A short video showing the mechanical assembly instructions is available [here](#).



Description	connects Juno ARM Development platform with proFPGA system
Documentation	Application Note AN499, assembly video
Compatibility	proFPGA uno V7, duo V7, quad V7, uno UltraScale, duo UltraScale and quad UltraScale Systems
Supported Veloce proFPGA FPGA Modules	Veloce proFPGA AMD® UltraScale™ VCU440 Module Veloce proFPGA AMD® UltraScale+™ XCVU19P Module
Requirements	proFPGA system, Juno ARM Development Platform
Order Code	286495

Veloce proFPGA PCIe Gen3 Root Complex Board

Technical Highlights

- PCIe x16 socket, where 8 MGT lanes are connected
- M.2 connector with Key M, where 4 MGT lanes are connected
- Additional 12V power connector
- 3 LEDs and one button for user usage
- proFPGA TOP connector, for unused IOs

Overview

This board has a PCIe x16 socket where 8 MGT lanes are connected and an M.2 socket with Key M where 4 MGT lanes are connected. In addition to this it offers a 12V power connector if the PCIe card draws too much current, 3 LEDs and one push button for user usage.

The proFPGA PCIe gen3 Root Complex Board will be plugged on an extension site of the proFPGA FPGA Module and offers a proFPGA top connector to make unused FPGA signals available.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	PCIe x16 socket, where 8 MGT lanes are connected M.2 connector with Key M, where 4 MGT lanes are connected
Others	An additional 12V power connector if the PCIe card draws too much current 3 x general purpose LEDs1 x and 1 x button PCIe bracket, that PCIe card can be fixed
Supported Veloce proFPGA FPGA Modules	Any
Product article number	pPROF0100 EB-PDS-ROOT-COMPLEX-M.2-R1
Order Number	286518

Veloce proFPGA SATA Interface Board

Technical Highlights

- 8 channels with up to 12.5 Gbps
- 8 SATA connectors (4x HOST, 4x DEVICE)
- 4 outputs programmable reference clock generator
- 2/4 MMCX connector pairs for clock output/input
- 4 multiplexers to select between local and remote clock

Overview

This daughter board occupies one extension site of the proFPGA system and provides 8 channels with run up to 12.5 Gbps on 8 SATA connectors (4xHOST, 4x DEVICE) which supports SATA Host and Device connections . The board offers Pericom PI3EQX1204 SATA redrivers to enable flexible high speed connection using SATA cables up to at least 1 m. Further it has a 4 outputs programmable reference clock generator, 2 MMCX connector pairs for clock output, 4 MMCX connector pairs for clock input, 4 on-board multiplexers to select between local and remote clock and 1 x proFPGA top connector to make unused FPGA signals available.



Channels and Performance	8 SATA channels with up to 12.5 Gbps
Interfaces	8 x SATA connectors 4 x HOST, 4x DEVICE
Others	Pericom PI3EQX1204 SATA redrivers enable high speed connection via SATA cables at least 1m 4 outputs programmable reference clock generator 2 MMCX connector pairs for clock output 4 MMCX connector pairs for clock input 4 on-board multiplexers to select between local and remote clock proFPGA top connector to make unused FPGA signals available
Supported VelocE proFPGA FPGA Modules	Any
Product article number	PROF064B EB-PDS-SATA
Order Code	286498

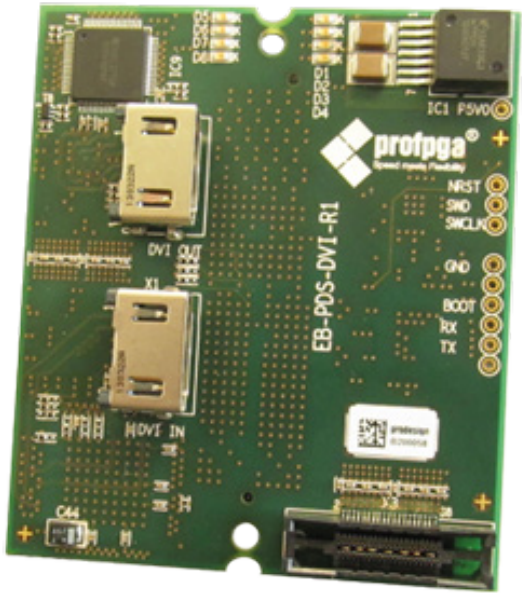
Veloce proFPGA DVI Interface Board

Technical Highlights

- 1 x DVI Transmitter (TI TFP410)
- 1 x DVI Receiver (TI TFP403)
- Up to 165 MHz pixel rates (including 1080p)
- 8 x general purpose LEDs
- 1 x Mictor-38 debug connector

Overview

This daughter board occupies one extension site of the proFPGA system and provides 1 x DVI Transmitter (TI TFP410) and 1 x DVI Receiver (TI TFP403) and runs with up to 165 MHz pixel rates (including 1080p and WUXGA @ 60 Mhz. Further with DVI on board, it provides 8 x general purpose LEDs and one Mictor-38 debug connector.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	4 GB
Others	DVI over HDMI connectors, DVI 1.0 compliant 8 x general purpose LEDs 1 x Mictor-38 debug connector
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF049 EB-PDS-DVI-R1
Order Code	286500

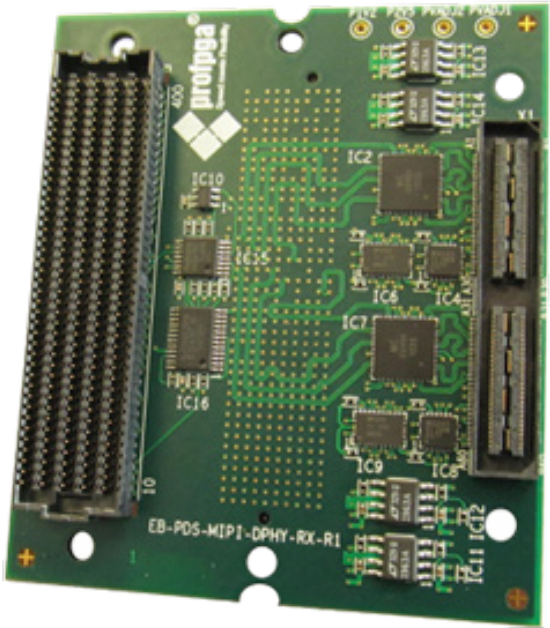
Veloce proFPGA MIPI Interface Board

Technical Highlights

- 2 x camera interfaces
- Compliant to MIPI D-PHY DSI, CSI-1, CSI-2 standard
- Transfer rates up to 2.5Gbps (HS mode)
- Transfer rates up to 20MBps (LPDT mode)
- 8x GPIO, I2C and a reference clock

Overview

This daughter board occupies one extension site of the proFPGA system and provides 2 x camera interfaces, each one clock lane and up to four data lanes and offers transfer rates of up to 2.5Gbps (HS mode) and 20MBps (LPDT mode). Further the board provides 8x GPIO a I2C, a reference clock available for each camera Interface and one proFPGA top connector to make unused IOs available.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	2 x camera interfaces, each one clock lane and up to four data lanes Compliant to MIPI D-PHY DSI, CSI-1, CSI-2 standard
Others	Transfer rates up to 2.5Gbps (HS mode), 20MBps (LPDT mode) 8x GPIO, I2C and a reference clock available for each camera Interface 1 x proFPGA top connector to make unused IOs available
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF050 EB-PDS-DPHY-RX-R1
Order Code	286493 (Tx), 286499 (Rx)

Veloce proFPGA QSFP+ Interface Board

Technical Highlights

- 2 x QSFP+ connectors
- Programmable clock generator for MGT_REFCLK pins
- Fixed clock generator (100 MHz) for MGT_REFCLK pins
- 1 x proFPGA top connector to make unused IOs available

Overview

This daughter board occupies one extension site of the proFPGA system and provides 2 x QSFP+ connectors. Further the board provides a programmable clock generator for MGT_REFCLK pins, a fixed frequency clock generator (100 MHz) for MGT_REFCLK pins and one proFPGA top connector to make unused IOs available.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	2 x QSFP+ connectors
Others	1 x proFPGA top connector making unused regular IOs available for further use Programmable clock generator for MGT_REFCLK pins Fixed frequency clock generator (100 MHz) for MGT_REFCLK pins
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF054 EB-PDS-QSFP+-R1
Order Code	286507

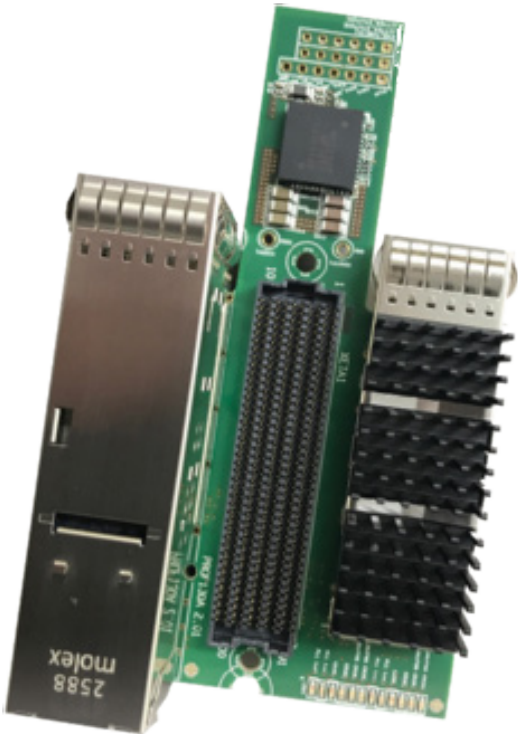
Veloce proFPGA QSPF28 Interface Board

Technical Highlights

- 2 x QSFP28 connectors with three ports
- maximum transfer rate of 4x28Gbit/s per socket
- Two programmable clock generator for MGT_REFCLK pins
- 1 x proFPGA top connector to make unused IOs available

Overview

This daughter board occupies one extension site of the proFPGA system and provides two QSFP28 connectors with three ports. Further the board provides two programmable clock generator for MGT_REFCLK pins (up to four individual Reference clocks) and one proFPGA top connector to make all unused regular IOs of the bottom connector available for further use (e.g. to connect a cable for interconnections to other FPGAs). The proFPGA QSFP2 supports the maximum transfer rate of 4x28Gbit/s per socket.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	2 x QSFP28 connectors
Others	1 x proFPGA top connector to make all unused regular IOs available for further use two QSFP28 connectors with three ports Two programmable clock generator for MGT_REFCLK pins (up to four individual Reference clocks)
Supported Veloce proFPGA FPGA Modules	Veloce proFPGA AMD® UltraScale+™ XCVU13P Module Veloce proFPGA AMD® UltraScale+™ XCVU37P Module
Product article number	PROF130A EB-PDS-QSFP28-R1
Order Code	286508

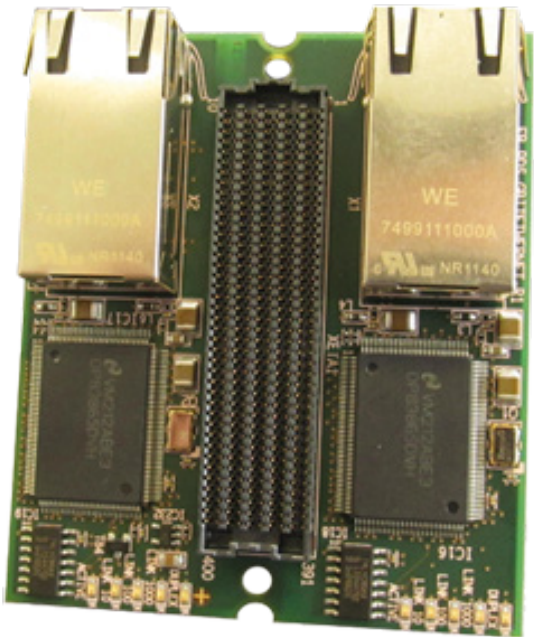
Veloce proFPGA Gigabit Ethernet Interface Board

Technical Highlights

- 2 x Gigabit PHYs
- Supporting 10M/100M/1G and MMII/GMII/RGMII
- All boot-strap signals are software programmable
- 5 x status LEDs per PHY (duplex, 1G, 100M, 10M, activity)
- 1 x proFPGA top connector to make unused IOs available

Overview

This daughter board occupies one extension site of the proFPGA system and provides two Gigabit PHYs supporting 10M/100M/1G and MMII/GMII/RGMII. Further the board provides 5 x status LEDs per PHY (duplex, 1G, 100M, 10M, activity) and one proFPGA top connector to make unused FPGA signals available.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	2 x Gigabit PHYs Supporting 10M/100M/1G and MMII/GMII/RGMII
Others	5 x status LEDs per PHY (duplex, 1G, 100M, 10M, activity) All boot-strap signals are software programmable 1 x proFPGA top connector to make unused IOs available
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF045a EB-PDS-GBITETHERNET-R1
Order Code	286512

Veloce proFPGA USB 2.0/3.0 Interface Board

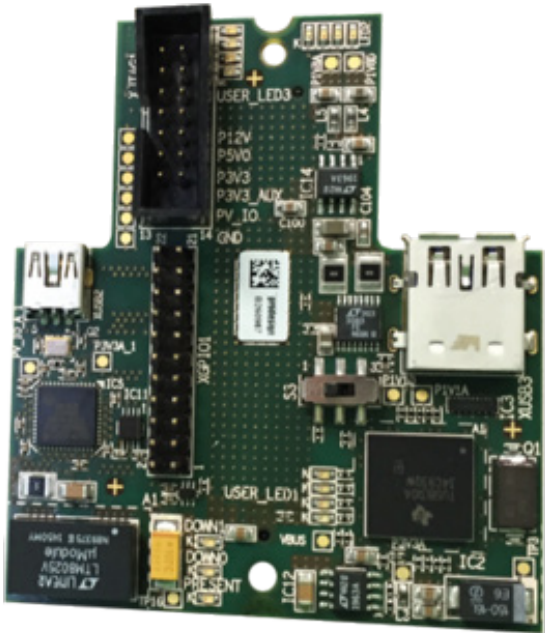
Technical Highlights

- 1x Mini USB connector (USB 2.0 device mode)
- 1x USB A female connector (USB 3.0 device and host mode)
- 12 user LEDs (3x blue, 3x green, 3x red, 3x yellow)
- GPIO header with 18 FPGA signals, 2x 1.8 V, 2x GND
- 14-pin JTAG connector (ARM JTAG)

Overview

This daughter board occupies one extension site of the proFPGA system and provides two USB ports. One USB port is available through a mini USB connector and is connected to a USB3250 (Microchip). The USB3250 is a hi-speed USB device transceiver with UTMI interface. This USB port can be used to implement a USB 2.0 device in the FPGA with UTMI interface.

The second USB port is available through a USB A female connector and is connected to a TUSB1310A (Texas Instruments). The TUSB1310A is a USB 3.0 Transceiver which can be either used as an USB host or device.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	1x Mini USB connector connected to USB3250 (USB 2.0 device mode) 1x USB A female connector to TUSB1310A (USB 3.0 device and host mode)
Others	12 user LEDs (3x blue, 3x green, 3x red, 3x yellow) connected to FPGA pins GPIO header with 18 FPGA signals, 2x 1.8 V, 2x GND 14-pin JTAG connector (ARM JTAG)
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF080 EB-PDS-USB2-3-R1
Order Code	286510

Veloce proFPGA USB 3.0 Interface Board

Technical Highlights

- 2 x USB 3.0 A female connectors
- Can be used either in host or in device mode
- USB 3.0 connection is provided with the TUSB1310A from TI
- 2 x AK669/3-3-R cables for use in host mode
- 2 x AK670/3-2-R cables for use in device mode

Overview

This daughter board occupies one extension site of the proFPGA system and provides two USB 3.0 A female connectors which can be used either in host or in device mode. The USB 3.0 connection is provided with the TUSB1310A from Texas Instruments. All IO and Clock IO pins of the extension board bottom connector are used. The MGT ports are not used. So it's preferred to put this board onto an FPGA connector without MGT ports or to put in onto an extension board with top connector which uses the MGT ports and only a short amount of IO pins.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	2 x USB 3.0 A female connectors Can be used either in host or in device mode
Others	proFPGA USB 3.0 Interface Board 2 x AK669/3-3-R cables for use in host mode 2 x AK670/3-2-R cables for use in device mode
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF044 EB-PDS-USB3-R1
Order Code	286511

Veloce proFPGA SoftTouch Debug Board (Keysight)

Technical Highlights

- 3 x SoftTouch Connectors (Keysight)
- 1 x 16x2 pin connector for general purpose IOs
- 1 x USB-UART debug interface via micro USB connector
- 1 x CPU ARM JTAG interface
- 16 LEDs for general purpose

Overview

This daughter board occupies one extension site of the proFPGA system and offers various connectors and interfaces for debugging purpose. It provides 3 xThree SoftTouch Connectors to interface the proFPGA system to standard Logic Analyzers(Keysight) or other measurement equipment, one 16x2 pin connector for general purpose IOs, one USB-UART debug interface over a micro USB connector (UART_TXD, UART_RXD, UART_RTSn, UART_CTSn), one CPUARM JTAG interface, 16 LEDs (D1...D16) with different colours and PV_IO power (X4) and GND (X5) connector.



Debug Interface 1	3 x SoftTouch Connectors to interface to standard Logic Analyzers (Keysight)
Debug Interface 2	1 x 16x2 pin GPIO connector
Debug Interface 3	1 x USB-UART debug interface over a micro USB connector
Debug Interface 4	1x CPU ARM JTAG Interface
Others	16 LEDs for general purpose (4x red, 4x blue, 4x yellow, 4x green) Equipped with ID chip for automatic board recognition via proFPGA motherboard
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF073 EB-PDS-DEBUG-R2
Order Code	286515

Veloce proFPGA SoftTouch Debug Board (Tektronix)

Technical Highlights

- 3 x SoftTouch Connectors(for Tektronix)
- 1 x 16x2 pin connector for general purpose IOs
- 1 x USB-UART debug interface via micro USB connector
- 1 x CPU ARM JTAG interface
- 16 LEDs for general purpose

Overview

This daughter board occupies one extension site of the proFPGA system and offers various connectors and interfaces for debugging purpose. It provides 3 x Three SoftTouch Connectors to interface the proFPGA system to standard Logic Analyzers (Tektronix) or other measurement equipment, one 16x2 pin connector for general purpose IOs, one USB-UART debug interface over a micro USB connector (UART_TXD, UART_RXD, UART_RTSn, UART_CTSn), one CPUARM JTAG interface, 16 LEDs (D1...D16) with different colours and PV_IO power (X4) and GND (X5) connector.



Debug Interface 1	3 x SoftTouch Connectors to interface to Logic Analyzers (Tektronix) or other measurement equipment
Debug Interface 2	1 x 16x2 pin GPIO connector
Debug Interface 3	1 x USB-UART debug interface over a micro USB connector
Debug Interface 4	1x CPU ARM JTAG Interface
Others	16 LEDs for general purpose (4x red, 4x blue, 4x yellow, 4x green) Equipped with ID chip for automatic board recognition via proFPGA motherboard
Supported Veloce proFPGA FPGA Modules	Veloce proFPGA AMD® Virtex-7TM XC7V2000T Module Veloce proFPGA AMD® UltraScale™ VCU440 Module Veloce proFPGA AMD® UltraScale™ XCKU115 Module Veloce proFPGA AMD® UltraScale+™ XCVU37P Module Veloce proFPGA AMD® UltraScale+™ XCVU19P Module Veloce proFPGA AMD® UltraScale+™ XCVU13P Module Veloce proFPGA AMD® UltraScale+™ XCVU9P Module Veloce proFPGA AMD® Zynq™ UltraScale+™ ZU19EG Module
Product article number	PROF073 EB-PDS-DEBUG-R4
Order Code	286516

Veloce proFPGA LAB and Debug Board

Technical Highlights

- 3 x Mictor connector for Logic Analyzer interface
- 1 x 20x2 pin GPIO connector
- 1 x UART debug interface via micro USB connector
- 1 x CPU ARM JTAG interface
- 16 x Debug LEDs

Overview

This daughter board occupies one extension site of the proFPGA system and offers various connectors and interfaces for debugging purpose. It provides 3 x Mictor connectors, to interface the proFPGA system to standard Logic Analyzers or other measurement equipment. Besides the board is equipped with an 1 x 20x2 pin connector for general purpose IOs an UART debug interface over a micro USB connector and a CPUARM JTAG interface. Furthermore the board is assembled with 16 LEDs, which can be used for general debug and test purposes.



Debug Interface 1	3 x Mictor connectors
Debug Interface 2	1 x 20x2 pin GPIO connector
Debug Interface 3	1 x UART over micro USB connector
Debug Interface 4	1x CPU ARM JTAG
Others	16 LEDs for general purpose Equipped with ID chip for automatic board recognition via proFPGA motherboard
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF05 EB-PDS-DEBUG-R1
Order Code	286513

Veloce proFPGA LAB and Debug Board SWD IO

Technical Highlights

- 2 x Mictor connectors to interface Logic Analyzers
- 20x2 pin connector for general purpose IOs
- 1 x USB-UART debug interface via micro USB connector
- 1 x CPU ARM JTAG interface
- 1 x μ SD-Card slot

Overview

This daughter board occupies one extension site of the proFPGA system and offers various connectors and interfaces for debugging purpose. It provides 2 x Mictor connectors to interface the proFPGA system to standard Logic Analyzers or other measurement equipment, one 20x2 pin connector for general purpose IOs, one USB-UART debug interface over a micro USB connector (UART_TXD, UART_RXD, UART_RTSn, UART_CTSn), one CPUARM JTAG interface, capability for Single Wire Debug via Pin JTAG-TMS and direction controlled by FPGA Pin SWDIO, one Cortex Debug Connector 0,05" 10-Pin Header, one Cortex Debug + ETM Connector 0,05" 20-Pin Header, 16 LEDs (D1...D16 connected to IO_000...IO_015), a single push button, a 8 position half pitch dip switch, a Mini Sim Slot (2FF), a μ SD-Card slot and PV_IO power (X4) and GND (X5) connector.



Debug Interface 1	2 x Mictor connectors to interface to standard Logic Analyzers or other measurement equipment
Debug Interface 2	1 x 20x2 pin connector for general purpose IOs
Debug Interface 3	1 x USB-UART debug interface over a micro USB connector
Debug Interface 4	1x CPU ARM JTAG Interface
Debug Interface 5	1 x Cortex Debug Connector 0,05" 10-Pin Header
Debug Interface 6	1 x Cortex Debug + ETM Connector 0,05" 20-Pin Header
Others	16 LEDs for general purpose (4x red, 4x blue, 4x yellow, 4x green) 1 x push button 1 x 8 position half pitch dip switch 1 x Mini Sim Slot (2FF) 1 μ SD-Card slot 1 x PV_IO power (X4) and GND (X5) connector 1 x Capability for Single Wire Debug and direction controlled by FPGA Pin SWDIO
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF090 EB-PDS-DEBUG-R3
Order Code	286514

Veloce proFPGA FMC Carrier Card Adapter

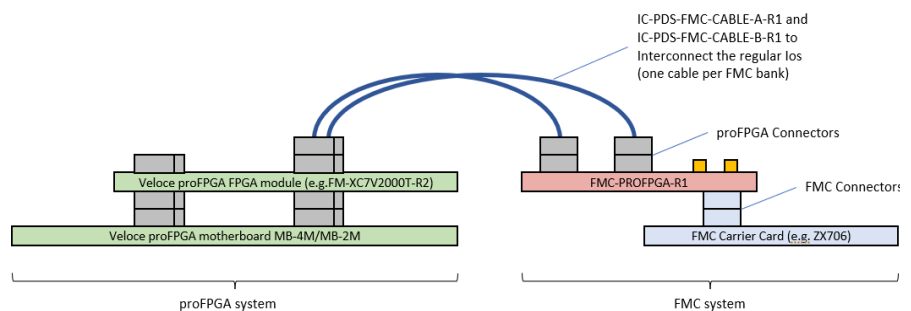
Technical Highlights

- 2 x proFPGA cable connectors (top-side)
- 1 x FMC HPC (high pin count) connector (bottom side)
- 40 x MMCX connectors for MGT signals
- 4 x MMCX connectors for MGT REFCLK signals
- 1 x PSU for VIO voltage generation of Bank B signals

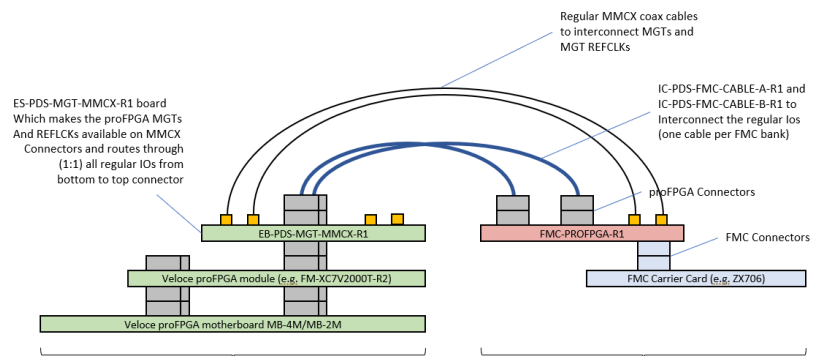


Overview

This daughter board occupies one extension site of the FMC carrier card and provides a connection between a FMC carrier card and the proFPGA system. It provides 2 proFPGA cable connectors (top-side), 1 FMC HPC (high pin count) connector (bottom side), 40 MMCX connectors for MGT signals (10 MGT RX and TX pairs), 4 MMCX connectors for MGT REFCLK signals (2 MGT Refclk pairs) and 1 PSU for VIO voltage generation of Bank B signals (voltage can be set via jumper). With this daughter card in combination with the proFPGA Interconnection Cables a FMC Carrier Card can easily be connected to Connector 0,05" 20-Pin Header, 16 LEDs (D1...D16 connected to IO_000...IO_015), a single push button, a 8 position half pitch dip switch, a Mini Sim Slot (2FF), a μ SD-Card slot and PV_IO power (X4) and GND (X5) connector.



proFPGA System connected with FMC Carrier Card (without MGT connections)



proFPGA System connected with FMC Carrier Card (including MGT connections)

proFPGA Connector	2 proFPGA cable connectors (top-side)
FMC Connection	1 FMC HPC (high pin count) connector (bottom side)
MGT Connection 1	40 MMCX connectors for MGT signals (10 MGT RX and TX pairs, 4 MMCX connectors for MGT REFCLK signals (2 MGT Refclk pairs)
MGT Connection 2	4 MMCX connectors for MGT REFCLK signals (2 MGT Refclk pairs)
Others	1 PSU for VIO voltage generation of Bank B signals (voltage can be set via jumper)
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF042 FMC-PROFPGA-R1
Order Code	286544

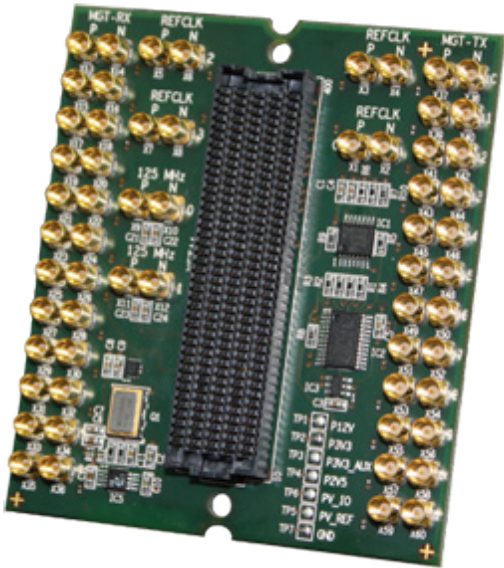
Veloce proFPGA MGT Debug Board

Technical Highlights

- 2 x 125 MHz differential clock outputs via MMCX connectors
- 4 x differential MGT REFCLK inputs via MMCX connectors
- 12 x differential MGT TX outputs via MMCX connectors
- 12 x differential MGT RX inputs via MMCX connectors
- proFPGA top connector to make all unused IOs available

Overview

This daughter board occupies one extension site of the proFPGA system and offers various MMCX connectors and interfaces for debugging purpose. It provides 2 x 125 MHz differential (LVDS) clock outputs via MMCX connectors. Both clock outputs are synchronous and based on the same 125 MHz clock generator. Besides it offers 12 differential MGT TX outputs via MMCX connectors, 12 differential MGT RX inputs via MMCX connectors and 4 differential MGT REFCLK inputs via MMCX connectors. In addition to this it provides a proFPGA top connector to make all unused IOs available for further connections or Connector 0,05" 20-Pin Header, 16 LEDs (D1...D16 connected to IO_000...IO_015), a single push button, a 8 position half pitch dip switch, a Mini Sim Slot (2FF), a µSD-Card slot and PV_IO power (X4) and GND (X5) connector.



proFPGA Connectors	2 proFPGA extension board connectors (1 at bottom-side, 1 at top side)
Clock Outputs 1	2 x 125 MHz differential (LVDS) clock outputs via MMCX connectors Both clock outputs synchronous and based on the same 125 MHz clock generator
Clock Inputs 1	4 x differential MGT REFCLK inputs via MMCX connectors USB connector
Clock Outputs 2	12 x differential MGT TX outputs via MMCX connectors
Clock Inputs 2	12 x differential MGT RX inputs via MMCX connectors
Others	proFPGA top connector to make all unused IOs available for further connections
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF038 EB-PDS-MGT-MMCX-R1
Order Code	286517

Veloce proFPGA ADC Interface Board

Technical Highlights

- 2x differential ADC input channels (MMCX connectors)
- 2 separated filtering circuits with removable shielding
- 2 x ADCs (ISLA216P25, Intersil)
- 1 clock generator, 2 clock outputs
- 1 external clock input, 1 external trigger input

Overview

This daughter board occupies one extension site of the proFPGA system and has two 16-bit 250MSPS ADCs (ISLA216P25, Intersil). Each ADC has one channel. The two input channels of the ADCs are connected with an input filtering stage to MMCX connectors. Both ADCs are directly connected to the bottom connector. Each ADC channel has its own analog ground and a shielding. The shielding is removable for customizing the filtering circuit.



A clock generator is on the board which sources the ADCs and 2 clock outputs. It is possible to work with the same clock for both ADCs or with different clocks. An external clock input is also connected to the clock generator which allows that one or both ADCs are working with the external clock source. An external trigger input is on the board. This port is connected to the proFPGA bottom connector and may be used for event management. The board has a proFPGA top connector which makes unused FPGA connections available to another extension board or a cable.

Inputs	2 differential ADC input channels (MMCX connectors), which are connected to 2 separated filtering circuits with removable shielding, which are connected to 2 ADCs (ISLA216P25, Intersil)
Clocking	1 clock generator which sources both ADCs with the identical or different clocks 2 clock outputs 1 external clock input connected to the clock generator 1 external trigger input connected to the proFPGA bottom connector
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF052 EB-PDS-ADC250x16-R2
Order Code	286496

Veloce proFPGA DAC Interface Board

Technical Highlights

- 16bit digital-to-analog converter (AD9142A, Analog Devices)
- Sample rates up to 1600MSPS
- Programmable clock generator
- Optional clock output and output via MMCX connectors
- 1 external clock input, 1 external trigger input

Overview

This daughter board occupies one extension site of the proFPGA system and provides a dual, 16bit digital-to-analog converter (AD9142A, Analog Devices) that supports sample rates up to 1600MSPS. Both DAC outputs are connected via analog filter stages to MMCX connectors.

A programmable clock generator is available to provide clocks to the DAC and optionally to the FPGA and MMCX connectors. There are also MMCX connectors as a alternative clock input of the clock generator at the board. Each DAC has its own filter stage shown in Figure 146. These stages are identically for each DAC output. The implemented Low pass filter (LFCN-800+, Mini-Circuits) passes frequencies between DC and 800MHz with a maximum insertion loss of 1.3dB through. Its cut-off frequency is 990Mhz.



Features	1x Analog Devices AD9142A TxDAC+ DAC 16bit digital-to-analog converter that supports sample rates up to 1600MSPS EMI shielding
Clocking	programmable clock generator (configuration via proFPGA plugin) optional clock output optional clock input optional clock connected to FPGAs clock capable inputs
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF053 EB-PDS-DAC1600x16-R2
Order Code	286497

Veloce proFPGA Multi Interface Board

Technical Highlights

- 2x 128M SPI Flash
- 2x MiniUSB UART connectors
- 8 GPIO pins available
- 1x EJTAG connector
- 1x SGPIO connector

Overview

This daughter board occupies one extension site of the proFPGA system and provides several interfaces and memories to the user like 1x SGPIO connector, I²C subsystem including I²C IDPROM, I²C multiplexer and I²C GPIO expander, 2x MiniUSB UART connectors, 1x EJTAG connector, 8 GPIO pins available, 2x DIP sockets, 1x I²C Connector, I²C Fan Control Unit, PMBus 6-channel Power-Supply Manager, PMBus Isolated Power-Supply Controller, 2x I²C EEPROM, 2x 128M SPI Flash, 8 RGB LEDs and one proFPGA Top Connector.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	1x SGPIO connector 2x MiniUSB UART connectors 1x EJTAG connector 8 GPIO pins available
Others	2x DIP sockets 1x I ² C Connector I ² C Fan Control Unit PMBus 6-channel Power-Supply Manager PMBus Isolated Power-Supply Controller 2x I ² C EEPROM 2x 128M SPI Flash 8 RGB LEDs I ² C subsystem including I ² C IDPROM, I ² C multiplexer and I ² C GPIO expander
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF065 EB-PDS-INTERFACE-R1
Order Code	286502

Veloce proFPGA Multi Interface Board 5

Technical Highlights

- 1x SD Card Slot, Full Size, UHS-I capable
- 1x quad USB to UART converter
- Lauterbach ARM JTAG/ETM Debugger connection
- 1x Stereo Audio Input & Output via 3.5 mm Jack
- 1x LIN Transceiver

Overview

This daughter board occupies two extension site of the proFPGA system and provides several interfaces and memories to the user like CAN Controller (SPI Interface) and CAN Transceiver, LIN Transceiver, I2S Audio CoDec (Analog Devices AD1938), Stereo Audio Input & Output via 3.5 mm Jack, 2x I²C EEPROM, SD Card Slot, Full Size, UHS-I capable, quad USB to UART converter, Lauterbach ARM JTAG/ETM Debugger connection (2x10-pin Header and Mictor-38), TotalPhase Aardvark I2C/SPI Host Adapter connection (2x5-pin Header), additional 2x10-pin JTAG Header ("Secondary JTAG") and one proFPGA Top Connector.



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	1x CAN Controller (SPI Interface) and CAN Transceiver 1x LIN Transceiver 1x Stereo Audio Input & Output via 3.5 mm Jack 1x Lauterbach ARM JTAG/ETM Debugger connection (2x10-pin Header and Mictor-38) 1x TotalPhase Aardvark I2C/SPI Host Adapter connection (2x5-pin Header) 1x additional 2x10-pin JTAG Header ("Secondary JTAG") 1x SD Card Slot, Full Size, UHS-I capable
Others	1x I2S Audio CoDec (Analog Devices AD1938) 2x I ² C EEPROM 1x quad USB to UART converter
Supported Veloce proFPGA FPGA Modules	Any
Product article number	PROF082 EB-PDS-INTERFACE-R5
Order Code	286504

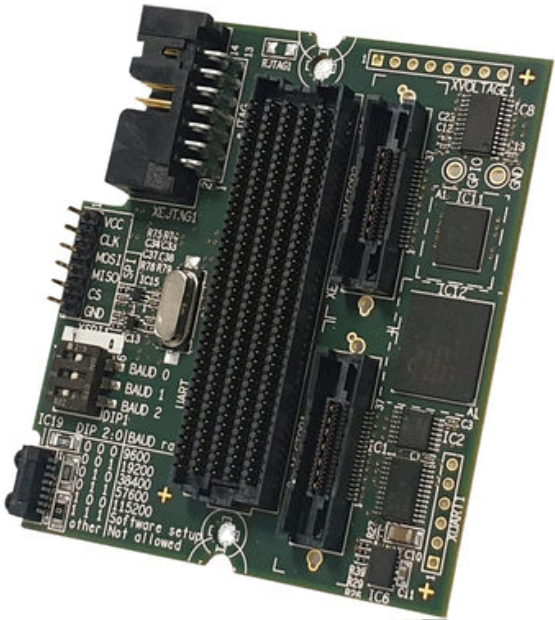
Veloce proFPGA Multi Interface Board 7

Technical Highlights

- 1 x EJTAG interface (as slave)
- 1 x 3.3 V SPI bus (as Master)
- 1 x IrDA UART interface
- 1 x GPIO for debugging

Overview

This daughter board occupies two extension site of the proFPGA system and provides several interfaces and memories to the user like CAN Controller (SPI Interface), EJTAG Interface, 3.3 V SPI bus, 256 MB parallel NOR FLASH Memory, 256 MB serial NAND FLASH Memory, IrDA UART interface with configurable BAUD-rate (up to 115200 BAUD) and a Single GPIO for debugging.



proFPGA Connectors	1x proFPGA bottom connector 1x proFPGA top connector
Interfaces	EJTAG interface (as slave) 3.3 V SPI bus (as Master) IrDA UART interface with configurable BAUD-rate (up to 115200 BAUD) Single GPIO for debugging
Others	256 MB parallel NOR FLASH Memory 256 MB serial NAND FLASH Memory
Supported Veloce proFPGA FPGA Modules	Any
Product article number	EB-PDS-INTERFACE-R7
Order Code	286505

Veloce proFPGA Zynq US+ Interface Board

Technical Highlights

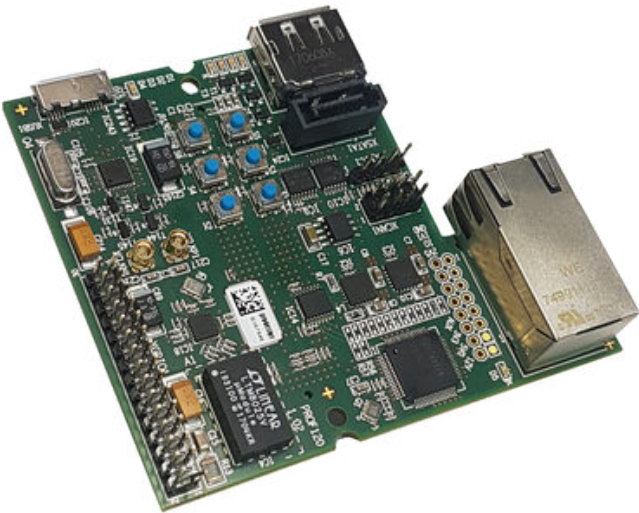
- 1x CAN Interface
- 1x Gbit ethernet interface
- 1x I²C interface
- 1x PMU access
- 1x SATA interface

Overview

This daughter board occupies one extension site of the proFPGA system and provides several interfaces to the user like CAN interface, displace port interface, Gbit ethernet interface, GPIO interface, I²C interface, PMU accessm SATA interface and USB 3.0 interface.

Price: on request, contact profpga@prodesign-europe.com

Accessories and extension boards



proFPGA Connectors	1x proFPGA extension board connector (1 at bottom-side)
Interfaces	1x CAN Interface 1x DisplayPort Tx interface 1x Gbit ethernet interface 1x GPIO interface 1x I²C interface 1x PMU access 1x SATA interface USB 3.0 interface
Supported Veloce proFPGA FPGA Modules	Veloce proFPGA AMD® Zynq™ UltraScale+™ ZU19EG Module
Product article number	PROF120 EB-FM-XCZUxxEG-R2
Order Code	286525

All of the Veloce proFPGA Extension Boards and Cables are part of Siemens Veloce HAV. To order a Veloce proFPGA extension board or cable contact your Siemens HAV sales representative with the order code, or contact us at 800-547-3000

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