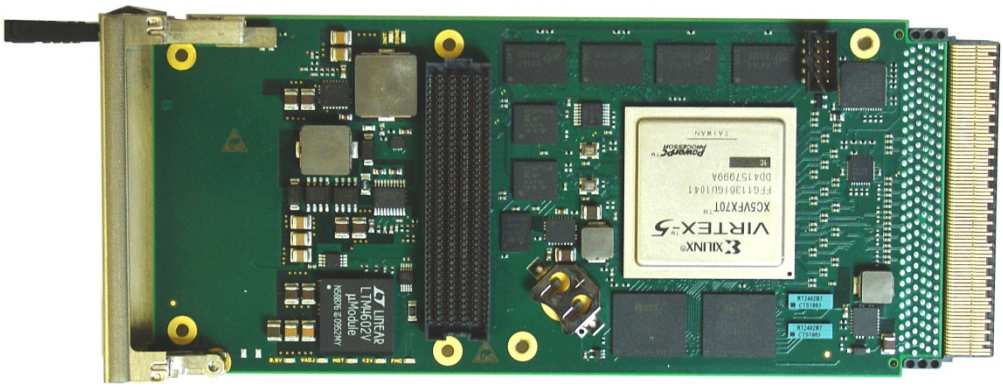
The Embedded I/O Company

TAMC641 High Performance Virtex-5 AMC with FMC-Slot



Application Information

The TAMC641 is a standard single Mid-Size or Full-Size AMC module providing a user configurable Virtex-5 FPGA. The integrated PCIe Endpoint Block of the Virtex-5 can be used to build an x1, x4 or x8 PCIe link via AMC Port 4-11. The implementation of other protocols like SRIO or XAUI is also possible. AMC Ports 0 & 1, commonly used for Gigabit Ethernet, and AMC Ports 2 & 3 are also connected to the FPGA. The integrated Gigabit Ethernet MACs of the Virtex-5 allow fast and easy protocol implementation.

To allow direct board-to-board communication, AMC Ports 12-17 are connected to Virtex-5 I/Os, allowing AC-coupled LVDS communication with a port speed up to 1.0Gb/sec.

For flexible I/O solutions the TAMC641 provides a VITA 57.1 high pin count FMC Module slot, allowing active and passive signal conditioning. All FMC I/O lines are directly connected to the FPGA, which maintains the flexibility of the Select I/O technology of the Virtex-5 FPGA.

In addition, the FPGA is connected to the following external memories:

- two banks of DDR2 SDRAM (up to 128 M x 32 (512 MB) each)

- two banks of QDR-II SRAM (up to 4 M x 18 (8 MB) each)

Multiple clocks from the AMC-interface, the FMC and from on-board sources are supplied to the FPGA.

The FPGA is configured by a flash device, which is in-system programmable and able to store multiple code versions.

The TAMC641 supports encrypted FPGA bitstream usage. Encrypted FPGA bitstreams cannot be copied or reverse engineered, securing your intellectual property.

The IPMI Connectivity Records located inside the Module Management Controller (MMC) can be modified by the customer (e.g. via IPMI), to adapt to the different possible communication protocols (PCIe, SRIO, XAUI, ...).

User applications for the TAMC641 require the full ISE Foundation software, which must be purchased from Xilinx.

The Engineering Documentation TAMC641-ED includes all information needed for customer specific FPGA programming. The FPGA Development Kit TAMC641-FDK includes the engineering documentation, ucf-files with all necessary pin assignments and basic timing constraints, and a well documented VHDL example application. This example application is called TPLD003 (Tews Programmable Logic Design) and covers the main functionalities of the TAMC641 like DMA capable PCIe endpoint with interrupt support, register mapping, DDR2 and QDR-II memory access and basic I/O to the FMC slot. It comes as a Xilinx ISE project with source code and as a ready-to-download bitstream. It is the basis for fast and reliable customer application development, and can significantly reduce time to market.

Software support for the TPLD003 is available for all major operating systems.

In-circuit programming and debugging of the FPGA design (e.g. using Xilinx “ChipScope”) is supported. The Program and Debug Box TA900 allows access to the module while it is inserted in a system. It provides access to the module's JTAG Chain, the UART of the on-board Module Management Controller (MMC) and to two user pins of the Virtex-5 FPGA. If a UART core is implemented in the FPGA, serial communication via the TA900 is possible.

The TA900 can be accessed by USB 2.0 and by a 14-pin JTAG Header (e.g. for connecting a Xilinx Platform Cable).

For First-Time-Buyers the TA900 and the TAMC641-ED or TAMC641-FDK is recommended.

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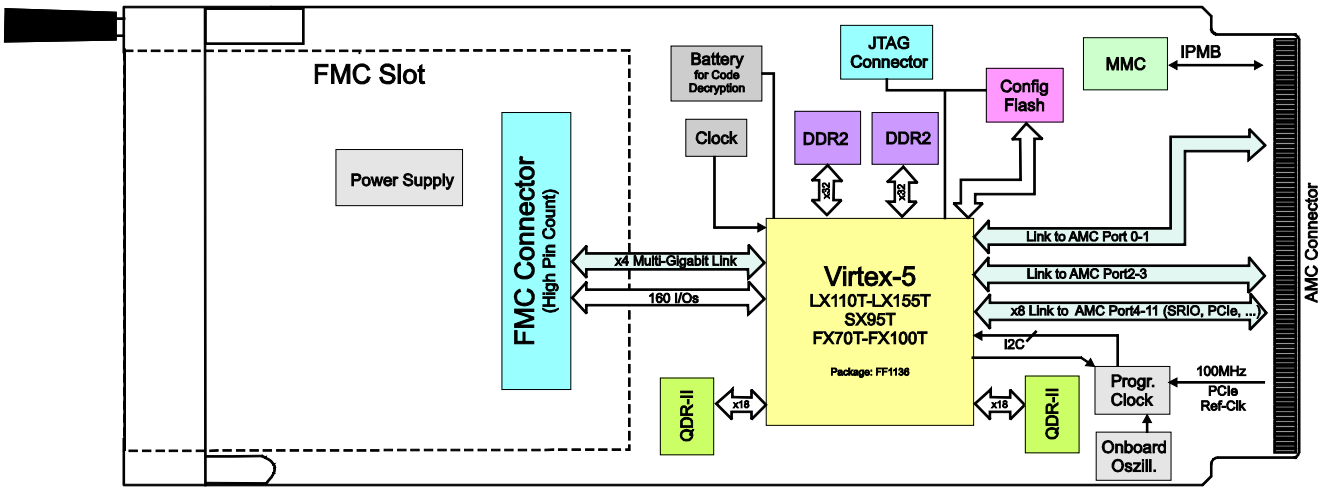
Technical Information

- Form Factor: PICMG AMC.0 R2.0 Module
  - Board size: single Mid-Size or Full-Size AMC
- AMC port 0 – 11 connected to FPGA MGTs
  - on-board AC-coupling for Rx and Tx
  - port speed up to 3.2Gb/sec (6.5Gb/s for FX)
- AMC port 12 – 15 & 17 connected to FPGA I/Os
  - on-board AC-coupling for Rx and Tx
  - port speed up to 1.0Gb/sec
- TCLKA – TCLKD support
- Virtex-5 FPGA with integrated PCIe Endpoint Block
  - XC5VLX110T or XC5VLX155T
  - XC5VSX95T
  - XC5VFX70T or XC5VFX100T
- 2 x QDR-II SRAM bank, 1M x18 (2 MB) each
- 2 x DDR2 SDRAM bank, 64 M x32 (256 MB) each
- IPMI V1.5 support
- Front panel LEDs:
  - Blue Hot Swap LED
  - Red FAIL LED (LED1)
  - Green USER / Power Good LED (LED2)
- Vita57.1 FMC Slot (high pin count)
  - 160 single ended I/Os or 80 differential
  - x4 Multi-Gigabit Link to FMC
  - V_{ADJ} = 1.2 – 3.3 Volt
- Operating temperature 0°C to +70°C
- MTBF (MIL-HDBK217F/FN2 G_B 20°C)
  TAMC641: 304000 h



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Order Information

RoHS Compliant

TAMC641-10R	Virtex-5 FPGA Module, Single Mid-Size, XC5VLX110T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot
TAMC641-11R	Virtex-5 FPGA Module, Single Full-Size, XC5VLX110T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot
TAMC641-12R	Virtex-5 FPGA Module, Single Mid-Size, XC5VLX155T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot
TAMC641-13R	Virtex-5 FPGA Module, Single Full-Size, XC5VLX155T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot
TAMC641-14R	Virtex-5 FPGA Module, Single Mid-Size, XC5VSX95T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot
TAMC641-15R	Virtex-5 FPGA Module, Single Full-Size, XC5VSX95T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot
TAMC641-16R	Virtex-5 FPGA Module, Single Mid-Size, XC5VFX70T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot
TAMC641-17R	Virtex-5 FPGA Module, Single Full-Size, XC5VFX70T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot
TAMC641-18R	Virtex-5 FPGA Module, Single Mid-Size, XC5VFX100T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot
TAMC641-19R	Virtex-5 FPGA Module, Single Full-Size, XC5VFX100T-1, 512 MB DDR3, 4 MB QDR-II, FMC Slot

Optional available on request:

- Operating temperature -40°C to +85°C
- Faster FPGA speed grades
- 1 GB DDR2 (2 banks 128 M x 32)
- 8 MB QDR-II (2 banks of 2 M x 18) or 16 MB QDR-II (2 banks of 4 M x 18)

For the availability of non-RoHS compliant (leaded solder) products please contact TEWS.

Documentation

TAMC641-DOC	User Manual
TAMC641-ED	Engineering Documentation includes TAMC641-DOC, Data Sheets, Constraints Files
TAMC641-FDK	FPGA Development Kit for TAMC641, includes TPLD003 Example Design

Accessories

TA900-10R	Program and Debug Box, USB, JTAG, 20pin FPC connector, including USB A-USB B and FPC Flexcable

Software

TDRV015-SW-25	Integrity Software Support (for basic example design TPLD003 of the TAMC641-FDK)
TDRV015-SW-42	VxWorks Software Support (for basic example design TPLD003 of the TAMC641-FDK, Legacy and VxBus-Enabled Software Support)
TDRV015-SW-65	Windows Software Support (for basic example design TPLD003 of the TAMC641-FDK)
TDRV015-SW-72	LynxOS Software Support (for basic example design TPLD003 of the TAMC641-FDK)
TDRV015-SW-82	Linux Software Support (for basic example design TPLD003 of the TAMC641-FDK)
TDRV015-SW-95	QNX Software Support (for basic example design TPLD003 of the TAMC641-FDK)

For other operating systems please contact TEWS.

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