AMC541

Xilinx Zynq® UltraScale+ FPGA with TCI6638 Multicore DSP+ARM, AMC

AMC541

Key Features

- Xilinx Zynq® UltraScale+™ XCZU19EG FPGA Multi Processor System on Chip (MPSoC)
- TCI6638K2K Multicore DSP+ARM® KeyStone II System-on-Chip (SoC)
- Dual bank of DDR4 64-bit wide with ECC to FPGA/SOC (16 GB total)
- Dual banks of DDR3 64-bit wide with ECC to TCI6638 (16 GB total)
- 3 SFP+ connectors to the front panel
- PCIe (AMC.1), 10/40GbE (AMC.2), SRIO (AMC.4) capability on Ports 4-7 (x4) and 8-11 (x4) per FPGA load
- SRIO x4 to DSP via MUX selection
- GbE on Ports 0,1 (AMC.2)

Benefits

- MPSoC FPGA and SoC DSP+ARM combination provides dense signal processing
- Electrical, mechanical, software, and system-level expertise in house
- Full system supply from industry leader
- AS9100 and ISO9001 certified company

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The AMC541 is based on the Xilinx Zynq® Ultrascale+ XCZU19EG MPSoC FPGA with embedded Quad-core ARM Cortex-A53 application processing unit, Dual-core ARM Cortex-R5 real-time processing unit, ARM Mali - MP2 GPU. The FPGA has Dual banks of 64-bit DDR4 memory (one bank to the ARM Core and one bank to the FPGA) and includes an SD card.

The AMC541 has the TCI6638K2K communications infrastructure KeyStone SoC, which is a member of the C66x family based on TI's new KeyStone II Multicore SoC Architecture, designed specifically for high-performance telecommunication, IoT and networking applications. It features eight TMS320C66x DSP core subsystems (C66x CorePacs). The TMS320C66x interfaces to dual 64-bit wide DRAM DDR3.

The flexible architecture including multiplexer allows the FPGA and DSP to interface to the AMC connector in different configurations. The AMC connector Ports 2-3 and 8-11 are linked directly to the FPGA for the core to interface with the host through multiple protocols such as SRIO, PCIe or 10/40GbE. Ports 4-7 can connect directly to the FPGA in addition to Ports 8-11 or connect directly to the DSP with SRIO protocol via MUX selection (DIP-switch selection).

The module also routes GbE on Ports 0 and 1 per AMC.2. The DSP and FPGA are linked via PCIe x2 and GbE.

The onboard, re-configurable FPGA interfaces to the AMC FCLKA (fabric clock) and TCLKA-D (user clocks and triggers) via a clock and jitter cleaner. The module also has a front panel TRIG IN and CLK IN to the clock and jitter cleaner.

The front panel SFP+ cage allows expansion via fiber 1/10GbE or 1/10GbE copper interface.

Figure 1: AMC541

Block Diagram

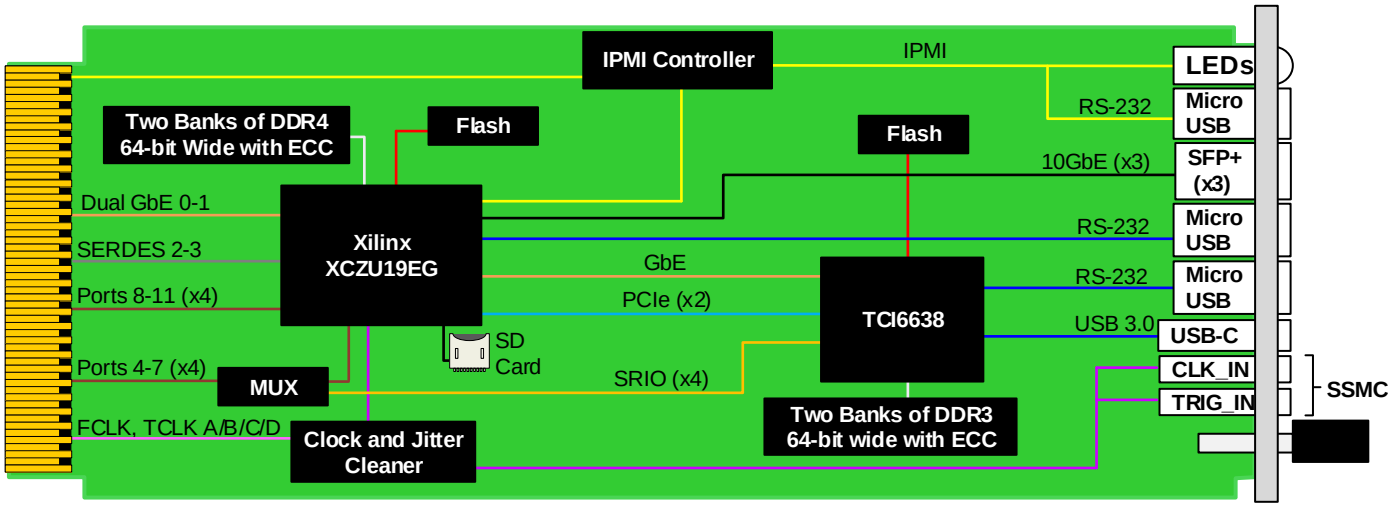

Figure 2: AMC541 Functional Block Diagram

Front Panel

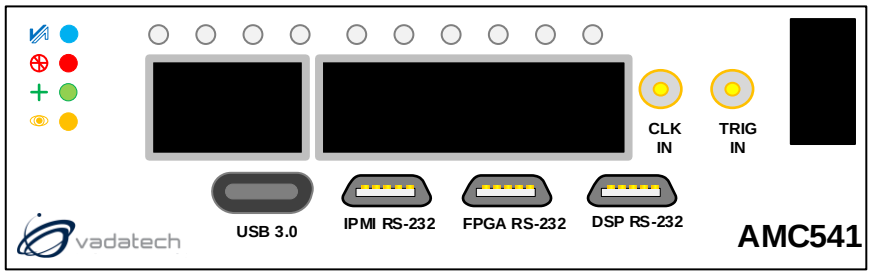

Figure 3: AMC541 Front Panel

Specifications

Architecture		
Physical	**Dimensions**	Single module, full-size
		Width: 2.89” (73.5 mm)
		Depth 7.11” (180.6 mm)
Type	**FPGA MPSoC AMC**	Xilinx Zynq® UltraScale+™ XCZU19EG
	DSP+ARM SoC	TCI6638K2KCXAAWA2(4); security accelerator enabled / general-purpose device
Standards		
AMC	**Type**	AMC.0, AMC.1, AMC.2 and AMC.4
Module Management	**IPMI**	IPMI v2.0
PCIe	**Lanes**	x4 or x8 (Ports 4-11), additional Ports on 2-3
SRIO	**Lanes**	Dual x4 (Ports 4-11), additional Ports on 2-3
10/40 GbE	**Lanes**	Dual x4 (Ports 4-11), additional Ports on 2-3
SRIO	**Lanes**	Single x4 to DSP (ports 4-7)
Configuration		
Power	**AMC541**	60W (application specific)
Environmental	**Temperature**	See Ordering Options and Environmental Spec Sheet
		Storage Temperature: –40° to +85°C
	Vibration	Operating 9.8 m/s^2 (1G), 5 to 500 Hz on each axis
	Shock	Operating 30Gs on each axis
	Relative Humidity	5 to 95% non-condensing
Front Panel	**Interface Connectors**	3 SFP+
		IPMI, FPGA and DSP serial RS-232 via Micro USB (2.0)
		USB Type C (3.0)
		Clk In and Trigger In via SSMC
	LEDs	IPMI management control
		Status
	Mechanical	Hot-swap ejector handle
Software Support	**Operating System**	Independent
Other		
MTBF	MIL Hand book 217-F@ TBD hrs	
Certifications	Designed to meet FCC, CE and UL certifications, where applicable	
Standards	VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards	
Warranty	Two (2) years, see VadaTech Terms and Conditions	

INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of OpenVPX, ATCA and MTCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTMs), Power Modules, and more. The company also offers integration services as well as pre-configured Application-Ready Platforms. Please contact VadaTech Sales for more information.

Ordering Options

AMC541 – ABC-DEF-GHJ

A = DSP Model	D = PCIe Option	G = SFP+ 10GbE base-SR (***)
0 = TCI6638K2KCXAAWA2 1 = TCI6638K2KCXAAWA24	0 = No PCIe 1 = PCIe on Ports 4-7* 2 = PCIe on Ports 8-11 3 = PCIe on Ports 4-11*	0 = No SFP+10GbE base-SR 1 = 1 2 = 2 3 = 3
B = Clock	**E = DSP SRIO**	**H = SFP Copper 1000Base-T (***)**
0 = Standard (XO) 1 = Stratum-3 (TCXO)	0 = No DSP SRIO 1 = DSP SRIO to Ports 4-7*	0 = No SFP Copper 1000Base-T 1 = 1 2 = 2 3 = 3
C = Front Panel	**F = SFP+ 10GbE Copper (***)**	**J = Temperature Range and Coating**
1 = Reserved 2 = Reserved 3 = Full-size 4 = Reserved 5 = Reserved 6 = Full-size, MTCA.1 (captive screw)	0 = No SFP+ 10GbE Copper 1 = 1 2 = 2 3 = 3	0 = Commercial (–5° to +55°C), No coating 1 = Commercial (–5° to +55°C), Humiseal 1A33 Polyurethane 2 = Commercial (–5° to +55°C), Humiseal 1B31 Acrylic 3 = Industrial (–20° to +70°C), No coating 4 = Industrial (–20° to +70°C), Humiseal 1A33 Polyurethane 5 = Industrial (–20° to +70°C), Humiseal 1B31 Acrylic 6 = Extended (–40° to +85°C), Humiseal 1A33 Polyurethane** 7 = Extended (–40° to +85°C), Humiseal 1B31 Acrylic**

Notes: *Only D=0 and D=2 are compatible with E=1

**Conduction cooled, temperature is at edge of module. Consult factory for availability

***F + G + H = 3 maximum

For operational reasons VadaTech reserves the right to supply a higher speed FPGA device than specified on any particular order/delivery at no additional cost, unless the customer has entered into a Revision Lock agreement with respect to this product.

Related Products

AMC725

- Intel® Xeon E3 processor options with PCH
- DVI graphics (SM750 w/16 MB DDR), up to 1920x1440 resolution
- Optional up to 256 GB SSD with RAID option

VT815

- 9U MTCA Chassis Platform, 12 slot, double-module
- Full redundancy
- High-bandwidth (20-lane) connections between adjacent slots

UTC004

- Single module, full size per AMC.0
- Unified 1 GHz quad-core CPU for MicroTCA Carrier Management Controller (MCMC) Shelf Manager, Clocking, and Fabric management
- Automatic fail-over with redundant UTC004s

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