AMC542

Intel Stratix-10™ GX2800 FPGA with Dual GbE/10GbE

AMC542

Key Features

- Intel Stratix-10™ GX2800 in F1760 package
- Onboard OCXO with better than +/-0.85ppm after 10 years providing reference for SyncE
- Dual embedded front 1G/10G SFP+ with SyncE capability
- AMC Ports 4-11 are routed to FPGA per AMC.1, AMC.2 and AMC.4 (protocols such as PCIe, SRIO, 10GbE/40GbE, etc. are FPGA programmable)
- AMC Ports 12-15 and 17-20 are routed to the FPGA per ordering option
- AMC FCLKA, TCLKA, TCLKB, TCLKC and TCLKD are routed
- Flexible PLL generating fixed protocol clocks and flexible user programmable clocks to the FPGA
- 16 GB of DDR4 (dual bank, 64-bit), Dual Flash (1Gb FPGA configuration and 2Gb NIOS II boot)

Benefits

- Capability for networking SyncE source
- Dual Bank of 64-bit wide DDR4 memory allows larger buffer sizes while processing and queuing data to the host
- 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 AMC542 is based on the Altera Stratix-10™ GX2800 FPGA in F1760 package and is compliant to AMC.1, AMC.2, AMC.3 and/or AMC.4 specifications.

The module has dual front panel SFP+ for 2x 10GbE fiber.

The onboard, re-configurable FPGA interfaces directly to the AMC FCLKA and TCLKA-D via a Cross Bar Switch (CBS) MLVDS. It also has two banks of DDR4 (64-bit wide) giving 16 GB total memory. This allows for large buffer sizes to be stored during processing as well as for queuing the data to the host. The module includes OCXO on-board clock reference which generates precise protocol fixed clocks routed to the FPGA to support SyncE over GbE and 10GbE.

The fabric is implemented to support dual x4 PCIe.
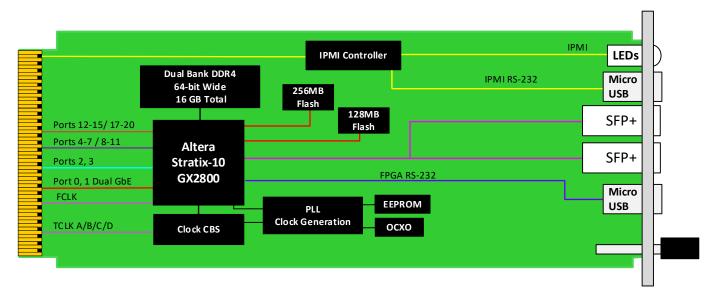

Figure 1: AMC542

Block Diagram

Figure 2: AMC542 Functional Block Diagram

AMC542 – Intel FPGA - Altera Stratix-10™ GX1150 dual SFP+ 10GbE

Reference Design

VadaTech provides an extensive range of FPGA-based products. The FPGA products are in two categories; FPGA boards with FMC carriers and FPGA products with high speed ADC and DACs. The FPGA products are designed in various architectures such as AMC modules, PCIe cards and Open VPX.

VadaTech provides a reference design implementation for our FPGAs complete with VHDL source code, documentation and configuration binaries. The reference design focuses on the I/O ring of the FPGA to demonstrate low-level operation of the interconnections between the FPGA and other circuits on the board and/or backplane. It is designed to prove out the hardware for early prototyping, engineering/factory diagnostics and customer acceptance of the hardware, but it does not strive to implement a particular end application. The reference VHDL reduces customer time to develop custom applications, as the code can be easily adapted to meet customer's application requirements.

The reference design allows you to test and validate the following functionality (where supported by the hardware):

- Base and Fabric channels
- Clocks
- Data transfers
- Memory
- User defined LEDs

VadaTech provides reference VHDL for testing basic hardware functionality. The reference VHDL is provided royalty free to use and modify on VadaTech products, so can be used within applications at no additional cost. However, customers are restricted from redistributing the reference code and from use of this code for any other purpose (e.g. it should not be used on non-VadaTech hardware).

The reference VHDL is shipped in one or more files based on a number of ordering options. Not all ordering options have an impact on the FPGA and a new FPGA image is created for those options that have direct impact on the FPGA. Use the correct reference image to test your hardware. For more information, refer to the FPGA reference design manual for your device which can be accessed from the customer support site along with the reference images.

Supported Software

- Default FPGA image stored in flash memory
- Default PLL setting stored in EEPROM
- Linux BSP
- Build Scripts
- Device Driver
- Reference application projects for other ordering options

The user may need to develop their own FPGA code or adapt VadaTech reference code to meet their application requirements. The supplied pre-compiled images may make use of hardware evaluation licenses, where necessary, instead of full licenses. This is because VadaTech does not provide licenses for the development tools or silicon vendor IP cores, so please contact FPGA vendor where these are required.

Specifications

Architecture		
Physical	**Dimensions**	Single module, mid-size (full-size and 8HP optional)
		Width: 2.89" (73.5 mm)
		Depth 7.11" (180.6 mm)
Type	**AMC FPGA**	Stratix-10™ GX2800 FPGA
Memory		Dual bank of DDR4 (64-bit wide)
Standards		
AMC	**Type**	AMC.0, AMC.1, AMC.2, AMC.3 and/or AMC.4
Module Management	**IPMI**	IPMI v2.0
PCIe	**Lanes**	Dual x4 via FPGA to AMC (4-11 option)
SRIO/Aurora	**Lanes**	Dual x4 via FPGA to AMC (4-11 option)
Ethernet	**1/10/40G**	Dual 1/10/40GbE via FPGA (Ports 0-1 and 4-11 option)
Configuration		
Power	**AMC542**	~45W (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	30G each axis
	Relative Humidity	5 to 95% non-condensing
Front Panel	**Interface Connectors**	Dual micro USB for MGT RS-232 and FPGA RS-232
		Dual SFP+
	LEDs	IPMI management control
		Four user defined LEDs
	Mechanical	Hot-swap ejector handle
Software Support	**Operating System**	Linux
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

AMC542 – ABC-0EF-G0J

A = Ports 12-15/17-20		G = Clock Holdover Stability
0 = Not routed to FPGA 1 = Routed to FPGA (SERDES)		0 = Reserved 1 = Reserved 2 = OCXO

B = SFP/SFP+ Transceiver Dual Ports	E = FPGA Speed	
0 = None 1 = 10GBASE-SR 2 = Reserved 3 = 10GBASE-LRM 4 = 10GBASE-LR 5 = Copper 1000Base-TX 6 = Fiber 1GbE SX 7 = Fiber 1GbE LX	1 = Reserved 2 = High 3 = Reserved	

C = Front Panel Size	F = PCIe Option	J = Temperature Range and Coating
1 = Reserved 2 = Mid-size (4 HP) 3 = Full-size (6 HP) 4 = 8HP 5 = Reserved 6 = Mid-size, MTCA.1 (captive screw) 7 = Full-size, MTCA.1 (captive screw) 8 = 8HP, MTCA.1 (captive screw)	0 = No PCIe 1 = PCIe on Ports 4-7 2 = PCIe on Ports 8-11 3 = Reserved 4 = Dual PCIe x4 on Ports 4-7 and 8-11	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: *Conduction cooled, temperature is at edge of module. Consult factory for availability

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

AMC536

- Altera Arria-10™ GX1150 FPGA
- Single module, mid-size AMC
- VITA 57 FMC carrier

PCI536

- PCIe FPGA carrier for FMC+ per VITA 57
- Altera Arria-10 GX1150 in F1517 package
- 16 GB of DDR4 (2 bank of 64-bits)

AMC756

- Intel Xeon E3 Processor AMC, PCIe Gen3
- PCIe Gen3 x4 on Ports 4-7 and 8-11 or single PCIe x8 on Ports 4-11 (AMC.1)
- High performance Xeon E3-1505M processor with CM238 PCH

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