

# **AMC536** – FPGA Altera Carrier for FMC, Arria-10™ GX1150



# **KEY FEATURES**

- Single module, mid-size AMC (full-size optional)
- Altera Arria-10 GX1150 in F1517 package
- AMC Ports 4-11 are routed to FPGA per AMC.1, AMC.2 and AMC.4 (protocols such as PCle, SRIO, 10GbE/40GbE, etc. are FPGA programmable)
- AMC Ports 12-15 and 17-20 are routed to the FPGA
- AMC FCLKA, TCLKA, TCLKB, TCLKC and TCLKD are routed
- Clock jitter cleaner
- 16 GB of DDR-4 (2 bank of 64-bits)
- IPMI 2.0 compliant



# **Benefits of Choosing VadaTech**

- Arria-10 FPGA in F1517 package
- Two 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

The AMC536 is based on the Altera Arria-10™ GX1150 FPGA in F1517 package. The AMC536 is compliant to the AMC.1, AMC.2, AMC.3 and/or AMC.4 specification.

The module routes all LA/HA/HB and 10 DP SERDES to the FMC slot.

The on-board, re-configurable FPGA which interfaces directly to the AMC FCLKA and TCLKA-D via a Cross Bar (CBS) MLVDS. The FPGA has interface to two DDR4, 64-bit wide, with 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.

### REFERENCE DESIGN

VadaTech provides a reference design implementation for our FPGAs complete with VHDL source code 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 geared to prove out the hardware for engineering/factory diagnostics and customer acceptance of the hardware, but it does not strive to implement a particular end application.

# **BLOCK DIAGRAM**

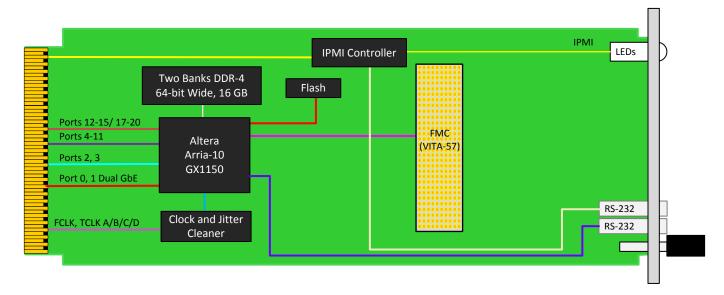


Figure 1: AMC536 Block Diagram



## **SPECIFICATIONS**

Physical Dimensions Single module, mid-size (full-size optional) Width: 2.89° (73.5 mm) Depth 7.11° (80.6 mm) Type AMC FPGA Arria-10™ GX1150 FPGA Three bank of DDR4 (64-bit wide)  Standards  AMC Type AMC.1, AMC.2, and AMC.4 (FPGA programmable) Module Management IPMI IPMI version 2.0 PCle Lanes Dual x4 or x8 via FPGA to AMC SRIO/Aurora Lanes Dual x4 via FPGA to AMC SRIO/Aurora Lanes Dual x4 via FPGA to AMC  Configuration Power AMC536 -30W (application specific)  Environmental Temperature Operating Temperature: -5° to 45°C (55°C for limited time, performance restrictions may apply), industrial and military versions also available. (See gravironmental spec sheet) Storage Temperature: -40° to 45°C Shook 30Gs on each axis Relative Humidity 5 to 95 per cent, non-condensing Front Panel Interface Connectors MGT RS-232 and CPU RS-232 LEDs IPMI management control 4 user defined LEDs  Mechanical Hot swap ejector handle  Software Support Operating System Linux Conformal Coating Humiseal 1831 Acrylic (Optional)  Otter MTBF MIL Hand book 217 F @ TBD Hrs Certifications Waranty VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards  Warranty Two (2) years	Architecture				
Width: 2.89" (73.5 mm)   Depth 7.11" (180.6 mm)		Dimensions	Single module, mid-size (full-size optional)		
Type     AMC FPGA     Aria-10™ GX1150 FPGA       Standards       AMC     Type     AMC.1, AMC.2, and AMC.4 (FPGA programmable)       Module Management     IPMI     IPMI version 2.0       PCle     Lanes     Dual x4 or x8 via FPGA to AMC       SRIO/Aurora     Lanes     Dual x4 via FPGA to AMC       Ethernet     1/10/40GbE     Dual 1/10/40 GbE via FPGA (ports 0-1 and 4-11)       Configuration       Power     AMC536     ~30W (application specific)       Environmental     Temperature     Operating Temperature: -5° to 45°C (55°C for limited time, performance restrictions may apply), industrial and military versions also available. (See environmental spec sheet)       Vibration     Operating 9.8 m/s² (1.0 G), 5 to 500Hz       Shock     300s on each axis       Relative Humidity     5 to 95 per cent, non-condensing       Front Panel     Interface Connectors     MGT RS-232 and CPU RS-232       LEDs     IPMI management control     4 user defined LEDs       Mechanical     Hot swap ejector handle       Software Support     Operating System     Linux       Conformal Coating     Humiseal 1A33 Polyurethane (Optional)       MTBF     MIL Hand book 217-F @ TBD Hrs       Certifications     Designed to meet FCC, CE and UL certifications where applicable       Standards       VadaTech is certifi	•				
Type     AMC FPGA     Aria-10™ GX1150 FPGA       Standards       AMC     Type     AMC.1, AMC.2, and AMC.4 (FPGA programmable)       Module Management     IPMI     IPMI version 2.0       PCle     Lanes     Dual x4 or x8 via FPGA to AMC       SRIO/Aurora     Lanes     Dual x4 via FPGA to AMC       Ethernet     1/10/40GbE     Dual 1/10/40 GbE via FPGA (ports 0-1 and 4-11)       Configuration       Power     AMC536     ~30W (application specific)       Environmental     Temperature     Operating Temperature: -5° to 45°C (55°C for limited time, performance restrictions may apply), industrial and military versions also available. (See environmental spec sheet)       Vibration     Operating 9.8 m/s² (1.0 G), 5 to 500Hz       Shock     300s on each axis       Relative Humidity     5 to 95 per cent, non-condensing       Front Panel     Interface Connectors     MGT RS-232 and CPU RS-232       LEDs     IPMI management control     4 user defined LEDs       Mechanical     Hot swap ejector handle       Software Support     Operating System     Linux       Conformal Coating     Humiseal 1A33 Polyurethane (Optional)       MTBF     MIL Hand book 217-F @ TBD Hrs       Certifications     Designed to meet FCC, CE and UL certifications where applicable       Standards       VadaTech is certifi			Depth 7.11" (180.6 mm)		
Standards  AMC Type AMC.1, AMC.2, and AMC.4 (FPGA programmable)  Module Management IPMI IPMI IPMI version 2.0  PCle Lanes Dual x4 or x8 via FPGA to AMC  SRIO/Aurora Lanes Dual x4 vix FPGA (ports 0-1 and 4-11)  Configuration  Power AMC.36 ~30W (application specific)  Environmental Temperature Operating Temperature: -5° to 45°C (55°C for limited time, performance restrictions may apply), industrial and military versions also available. (See environmental spec sheet)  Vibration Operating 9.8 m/s² (1.0 G), 5 to 500Hz  Shock 30Gs on each axis Relative Humidity 5 to 95 per cent, non-condensing  Front Panel Interface Connectors MGT RS-232 and CPU RS-232  LEDS IPMI management control  4 user defined LEDs  Mechanical Hot swap ejector handle  Software Support Operating System Linux  Conformal Coating Humiseal 1B31 Acrylic (Optional)  Humiseal 1B31 Acrylic (Optional)  Certifications Designed to meet FCC, CE and UL certifications where applicable  Standards VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards	Type	AMC FPGA			
AMC         Type         AMC.1, AMC.2, and AMC.4 (FPGA programmable)           Module Management         IPMI         IPMI version 2.0           PCIe         Lanes         Dual x4 or x8 via FPGA to AMC           SRIO/Aurora         Lanes         Dual x4 via FPGA to AMC           Ethernet         1/10/40GbE         Dual 1/10/40 GbE via FPGA (ports 0-1 and 4-11)           Configuration         Power         AMC536         ~30W (application specific)           Environmental         Temperature         Operating Temperature: -5° to 45°C (55°C for limited time, performance restrictions may apply), industrial and military versions also available. (See environmental spec sheet)           Environmental         Temperature         Operating 9.8 m/s² (1.0 G), 5 to 500Hz           Shock         30Gs on each axis           Relative Humidity         5 to 95 per cent, non-condensing           Front Panel         Interface Connectors         MGT RS-232 and CPU RS-232           LEDs         IPMI management control           4 user defined LEDs         Mechanical         Hot swap ejector handle           Software Support         Operating System         Linux           Configuration         Humiseal 1A33 Polyurethane (Optional)           Will Hand book 217-F @ TBD Hrs           Cettiffications         Designed to meet FCC, CE and UL certifications wh			Three bank of DDR4 (64-bit wide)		
AMC         Type         AMC.1, AMC.2, and AMC.4 (FPGA programmable)           Module Management         IPMI         IPMI version 2.0           PCIe         Lanes         Dual x4 or x8 via FPGA to AMC           SRIO/Aurora         Lanes         Dual x4 via FPGA to AMC           Ethernet         1/10/40GbE         Dual 1/10/40 GbE via FPGA (ports 0-1 and 4-11)           Configuration         Power         AMC536         ~30W (application specific)           Environmental         Temperature         Operating Temperature: -5° to 45°C (55°C for limited time, performance restrictions may apply), industrial and military versions also available. (See environmental spec sheet)           Environmental         Temperature         Operating 9.8 m/s² (1.0 G), 5 to 500Hz           Shock         30Gs on each axis           Relative Humidity         5 to 95 per cent, non-condensing           Front Panel         Interface Connectors         MGT RS-232 and CPU RS-232           LEDs         IPMI management control           4 user defined LEDs         Mechanical         Hot swap ejector handle           Software Support         Operating System         Linux           Configuration         Humiseal 1A33 Polyurethane (Optional)           Will Hand book 217-F @ TBD Hrs           Cettiffications         Designed to meet FCC, CE and UL certifications wh	Standards				
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SRIO/Aurora       Lanes       Dual x4 via FPGA to AMC         Ethernet       1/10/40GbE       Dual 1/10/40 GbE via FPGA (ports 0-1 and 4-11)         Configuration       Power       AMC536       ~30W (application specific)         Environmental       Temperature       Operating Temperature: -5° to 45°C (55°C for limited time, performance restrictions may apply), industrial and military versions also available. (See environmental spec sheet)         Environmental       Vibration       Operating 9.8 m/s² (1.0 G), 5 to 500Hz         Environmental       Shock       30Gs on each axis         Foothea       Relative Humidity       5 to 95 per cent, non-condensing         Front Panel       Interface Connectors       MGT RS-232 and CPU RS-232         LEDs       IPMI management control         4 user defined LEDs       Mechanical       Hot swap ejector handle         Software Support       Operating System       Linux         Conformal Coating       Humiseal 1A33 Polyurethane (Optional)         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	Module Management	IPMI	IPMI version 2.0		
Ethernet       1/10/40GbE       Dual 1/10/40 GbE via FPGA (ports 0-1 and 4-11)         Configuration         Power       AMC536       ~30W (application specific)         Environmental       Temperature       Operating Temperature: -5° to 45°C (55°C for limited time, performance restrictions may apply), industrial and military versions also available. (See environmental spec sheet)         Environmental       Vibration       Operating 9.8 m/s² (1.0 G), 5 to 500Hz         Shock       30Gs on each axis         Relative Humidity       5 to 95 per cent, non-condensing         Front Panel       Interface Connectors       MGT RS-232 and CPU RS-232         LEDs       IPMI management control         4 user defined LEDs       Mechanical       Hot swap ejector handle         Software Support       Operating System       Linux         Conformal Coating       Humiseal 1A33 Polyurethane (Optional)         WITER       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	PCle	Lanes	Dual x4 or x8 via FPGA to AMC		
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A user defined LEDs   Mechanical Hot swap ejector handle   Software Support Operating System Linux   Conformal Coating Humiseal 1A33 Polyurethane (Optional)   The second Humiseal 1B31 Acrylic (Optional)   Other		Interface Connectors	MGT RS-232 and CPU RS-232		
Mechanical Hot swap ejector handle  Software Support Operating System Linux  Conformal Coating Humiseal 1A33 Polyurethane (Optional)  Humiseal 1B31 Acrylic (Optional)  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		LEDs	<del>-</del>		
Software Support Operating System Linux Humiseal 1A33 Polyurethane (Optional) Humiseal 1B31 Acrylic (Optional)  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					
Conformal Coating Humiseal 1A33 Polyurethane (Optional) Humiseal 1B31 Acrylic (Optional)  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			Hot swap ejector handle		
Humiseal 1B31 Acrylic (Optional)  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		Operating System			
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	Conformal Coating				
MTBFMIL Hand book 217-F @ TBD HrsCertificationsDesigned to meet FCC, CE and UL certifications where applicableStandardsVadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards			Humiseal 1B31 Acrylic (Optional)		
Certifications         Designed to meet FCC, CE and UL certifications where applicable           Standards         VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards					
Standards VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards					
Warranty Two (2) years			both the ISO9001:2000 and AS9100B:2004 standards		
	Warranty	Two (2) years			

### INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of ATCA and  $\mu$ TCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTM), 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.

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# **ORDERING OPTIONS**

# AMC536 - A0C - 0EF - G0J

#### A = Ports 12-15/17-20

0 = Not routed to FPGA

1 = Routed

# C = Front Panel Size

1 = Reserved

2 = Mid-size (4HP)

3 = Full-size (6HP)

5 = Mid-size, MTCA.1 (captive screw)

6 = Full-size, MTCA.1 (captive screw)

\*Edge of module for conduction-cooled boards

# E = FPGA Speed

1 = Highest

2 = High

3 = Reserved

# F = PCle Option

0 = No PCle

1 = PCle on ports 4 - 7

2 = PCle on ports 8 - 11

3 = PCle on ports 4 - 11

### G = Clock Holdover Stability

0 = Standard XO

1 = Stratum-3 (TCXO)

## J = Temperature Range and Coating

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

 $3 = \text{Industrial } (-20^{\circ} \text{ to } +70^{\circ} \text{ C}), \text{ No coating}$ 

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\*

# RELATED PRODUCTS







VT899 Cube Chassis

FMC223 High Speed FMC for DAC

UTC020 1000W Power Module

## **CONTACT US**

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