VT955

1U Rugged Chassis Platform with 6 AMC Slots

VT955

Key Features

- MicroTCA rugged 1U 19" rackmount chassis platform
- Supports front-panel customization with MIL-38999 style connectors
- Designed to meet MIL-STD-810F, MIL-STD-901D for shock/vibration
- Designed to meet MIL-STD-461E for EMI
- Supports up to six single mid-size modules
- Full Layer 2 or 3 managed Ethernet switch
- Dual x4 or single x8 PCIe Gen 3 per AMC slot
- Chassis accepts AMCs with single retention screw opposite of ejector handle on each slot
- Management can run as Shelf/MCMC or MicroTCA Carrier Management Controller (MCMC)
- AMC.1, AMC.2, AMC.3 and AMC.4 compliant
- Front to back airflow
- Lightweight aluminum construction

Benefits

- Advanced GPS clocking/receiver options including IEEE 1588, SyncE, and NTP clocking
- Design utilizes proven VadaTech subcomponents and engineering techniques
- AS9100 and ISO9001 certified company
- Full system supply from industry leader

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The VT955 is a rugged 1U chassis used in Mil/Aero or other applications that need to withstand shock/vibration. The lightweight aluminum construction provides 6 single module mid-size AMC slots. For front panel retention, there is a single MicroTCA.1 screw on the opposite side of the ejector handle on each module slot.

The VT955 allows for the conversion of front panel I/O to MIL-38999 style or any customer-specific I/O connectors.

The front-to-rear cooled chassis utilizes the VadaTech 3rd generation MCH (UTC004 product) for its shelf manager, crossbar clocking for low jitter, GPS/IEEE1588/SyncE/NTP, etc. The VT955 has PCIe Gen3 x8 routed to each AMC slot. The x8 routing could run also as dual x4.

The VT955 backplane provides direct connection between adjacent AMC slots on Ports 2-3 and on Ports 12-20.

Power Supplies

The VT955 has option for AC or DC input. via the front panel. The module has a single power supply which is removable from the rear of the chassis.

Cooling and Temperature Sensors

The VT955 has intelligent Cooling Units that are built into the removable power supply trays. The cooling airflow is from front to back. Temperature sensors fitted throughout the chassis monitor intake and outtake air temperature.

Base/Fabric Channel Ethernet Switch

The VT955 provides a standard a GbE base channel switch which includes two 10GbE uplink 100/1000/10G RJ45 ports. This switch is fully Layer 2 or Layer 3 managed enabling a comprehensive enterprise-grade routing and switching feature set. It supports Synchronous Ethernet (SyncE) and IEEE1588.

Scorpion™ Software

VadaTech's Scorpionware software can be used to access information about the current state of the Shelf or the Carrier, obtain information such as the FRU population, or monitor alarms, power management, current sensor values, and the overall health of the Shelf. The software GUI is very powerful, providing a Virtual Carrier and FRU construct for a simple, effective interface.

Figure 1: VT955

Chassis

Figure 2: VT955 Chassis Front View

Figure 3: VT955 Chassis Rear View

GPS and General-Purpose Clocks

The MTCA specification defines a set of clocks for telecom and non-telecom applications. The VadaTech VT955 has the most sophisticated clocking distribution in the market to meet the most stringent requirements such as wireless infrastructure, high speed A/D, etc. The VT955 supports the following GPS and general-purpose clocking features:

- Low-jitter/low-skew backplane crossbar clock routing matrix for TCLKA(CLK1)/TCLKB(CLK2)/TCLKC/TCLKD for all AMCs
- FCLKA is provided as a 100 MHz HCSL clock
- Clock disciplining with arbitrary clock frequency output and holdover (Stratum-3 option) including 1PPS regeneration and holdover
- Flexible integration and synchronization between GPS, IEEE1588/SyncE, and NTP clocking enabling Grand Master clock functionality
- 'Any Frequency' high-quality clock generation/jitter cleaning for up to two user clocks
- Supports hitless automatic clock failover for improved reliability
- Optional built-in GPS receiver enables direct time/clock synchronization to the GPS satellite constellation.

The VT955 supports flexible front panel clock port ordering options:

- Two DC-coupled LVCMOS Inputs/Outputs, or two AC-coupled Sine-wave Inputs, or one of each
- Built-in GPS receiver for time/location/clock synchronization plus a DC-coupled LVCMOS Input/Output.

GPS Receiver Enabled Features

The VT955 can be ordered with a GPS Receiver option. The receiver disciplines an on-board high-quality DPLL which is phase/frequency aligned to the atomic clocks in the GPS satellite constellation. The on-board clock synthesis/jitter cleaning capability can be utilized to convert this frequency into any frequency desired while still remaining locked to the GPS atomic clocks.

When the GPS Receiver option is purchased the VT955 has the capability to re-transmit the incoming GPS data via Ethernet to other nodes in the network in the Trimble TSIP binary protocol format. This GPS data is also sent out the front panel GPS RS-232 serial port in the standard NMEA format for use by external equipment. When the GPS Receiver option is purchased along with the PCIe Fat Pipes fabric, the MCH also provides a precision PCIe Time-stamping Engine capability to a PrAMC PCIe Root Complex on the backplane. This engine appears as a PCIe device to the AMC card and a device driver is available which will allow the AMC card to read all GPS status including position, velocity, status, etc., in addition to precision timestamps, time trigger, and time event interrupt functionalities.

IEEE1588 PTP and NTP Grand Master Clock

The VT955 can provide Ethernet time services to the chassis networks on both the GbE fabric. It can be subordinate to an external PTP or NTP master server or when the GPS receiver option is purchased can act as a Grand Master clock utilizing the precision timing information provided via the GPS receiver and on-board disciplined oscillator.

Synchronous Ethernet

The VT955 provides a Synchronous Ethernet (SyncE) on the GbE fabric port. With this feature, ports on the 1G Ethernet switch can be designated as master or slave ports and the Ethernet fabrics within the chassis can be synchronized from end-to-end with external equipment. This feature utilizes advanced telecom-grade network synchronization PLLs to provide exceptional SyncE performance.

JTAG Master/JTAG Via Ethernet Virtual Probe

The VT955 provides JTAG Master Capability to send out configuration data streams via the chassis JTAG Switch Module (JSM) to configure arbitrary JTAG Slave devices on AMC cards. Virtual Probe services are also available to provide JTAG via Ethernet for specific vendors such as Xilinx and Altera. This allows for standard development tools such as Xilinx iMPACT/ChipScope and Altera Programmer/SignalTap to treat the MCH/JSM combination as if it was a standard JTAG probe. This approach frees the developer from having to attach JTAG probes directly to the AMC or JSM which can be difficult when systems are already fully assembled. It also allows for remote debugging across long distances when required without the need to install additional JTAG equipment on-site. The Master test/configuration port is easily accessible via the front panel header.

VadaTech Single Latching Flange (SLF) Design

The VadaTech SLF design is a space-saving solution for rugged environments and is compatible with the VT955. It provides one latching flange and screw on the opposite side of the standard AMC latching handle. This front panel solution provides improved retention strength and stability. MicroTCA.1 compliant AMCs have latching flanges on both sides of the board, providing up to 25g shock and 8g random vibration resistance. However, in horizontal-mount enclosures the dual flanges take up considerable space. The SLF design from VadaTech reduces the space utilized, allowing more performance density to be offered in specially-designed enclosures. The SLF solution's screw spacing is compatible with MicroTCA.1. Therefore, this design can be utilized in all of VadaTech's standard 3U to 5U horizontal-mount chassis that accept both MicroTCA.0 and MicroTCA.1 panels.

Figure 4: Single Latching Flange Panel (example)

There are also Latching Tabs available to provide extra secure mounting for standard MicroTCA.0 AMCs.

*Figure 5: Latching Tab for Standard MTCA.0 AMC*

Block Diagram
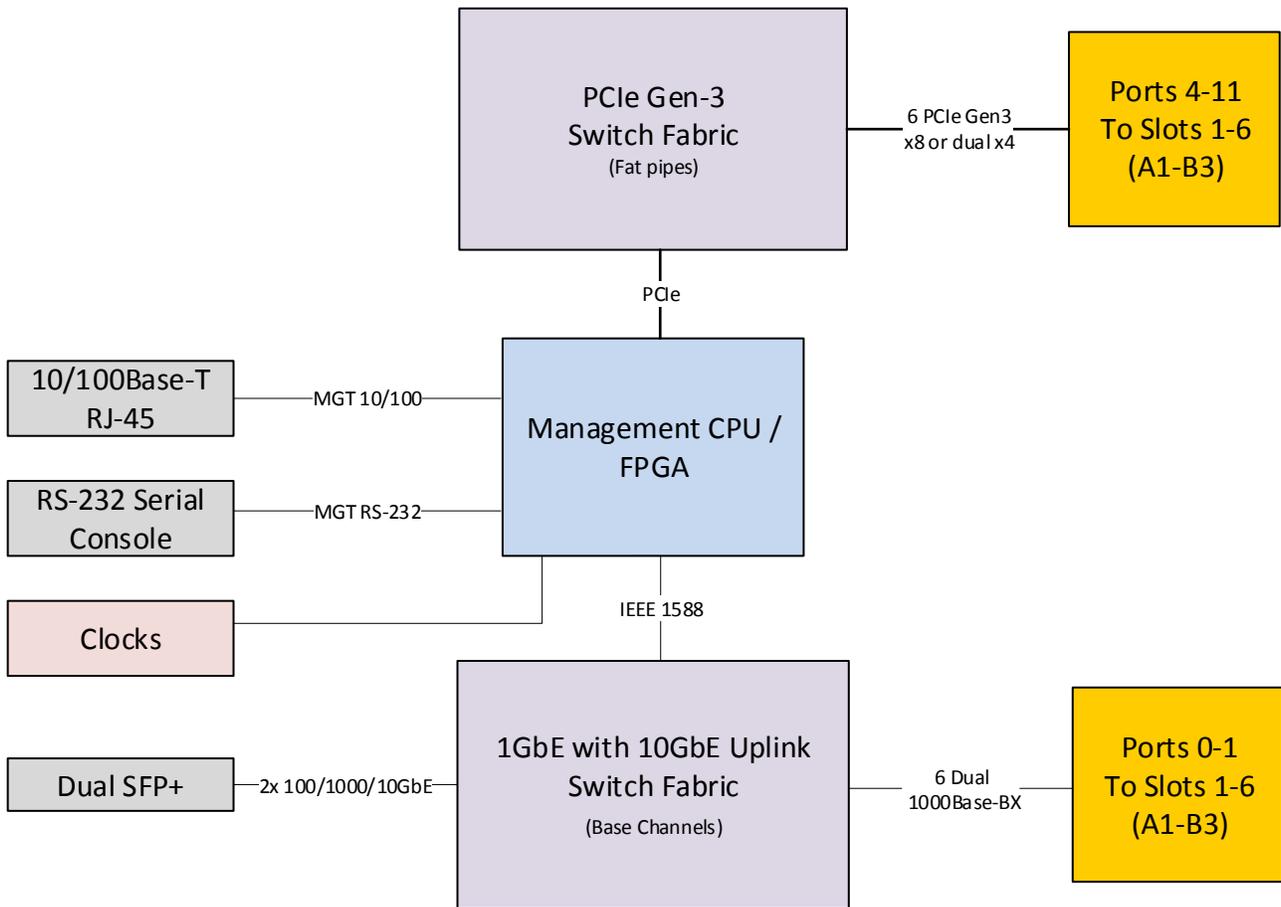
Figure 6: VT955 Block Diagram

Chassis Layout
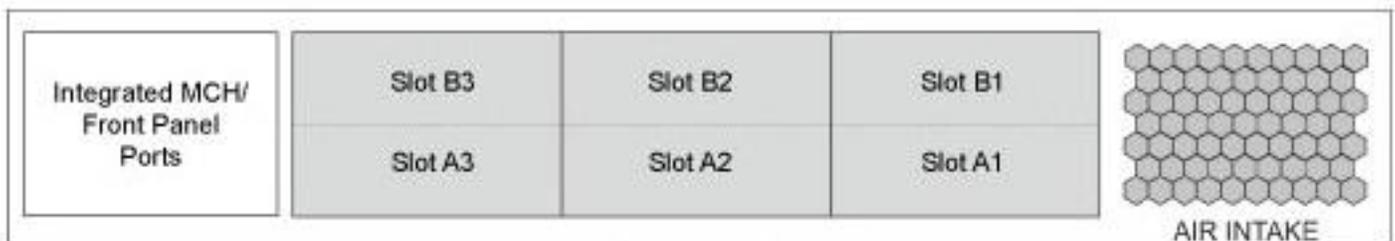
Figure 7: VT955 Front Panel

VT955 – 1U Rugged Chassis Platform with 6 AMC Slots
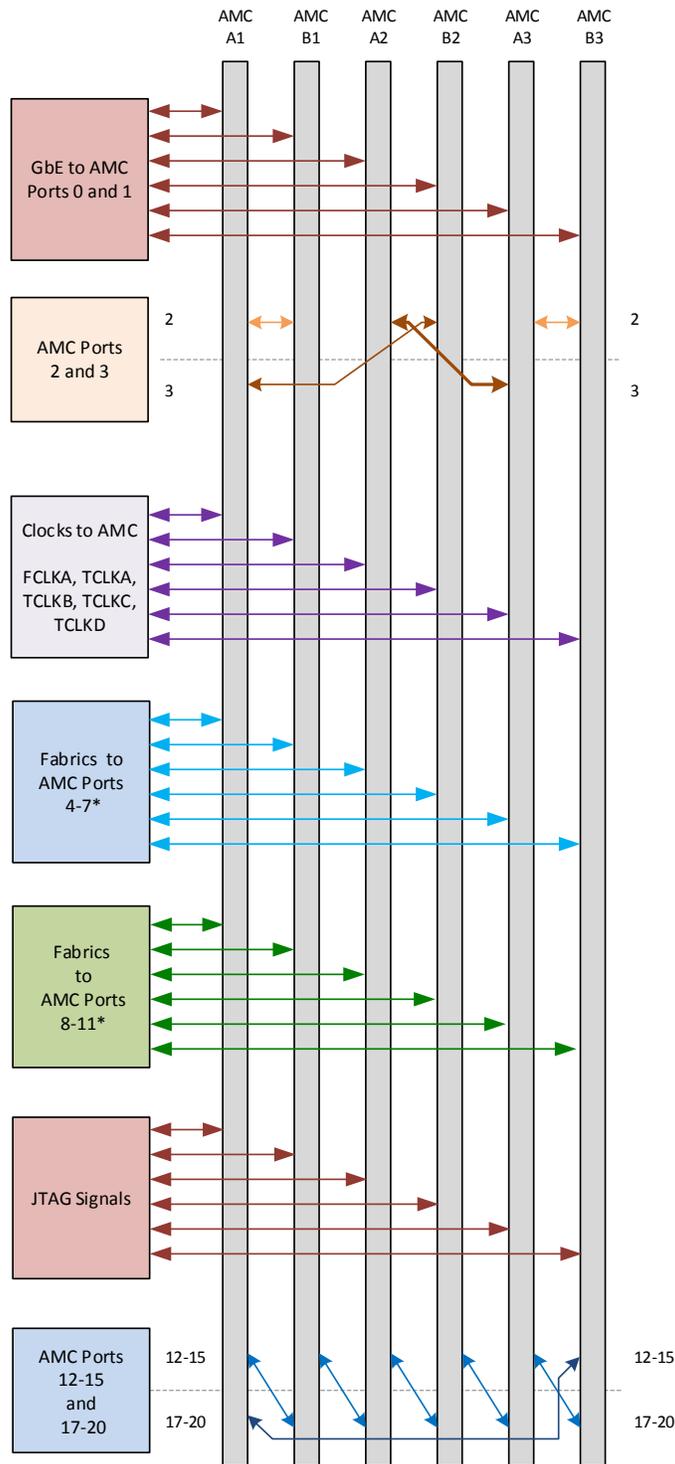
Backplane Connections

Figure 8: VT955 Backplane Connections

Specifications

Architecture		
Physical	**Dimensions**	Height: 1U
		Width: 19"
		Depth: 18.50"
Type	**MTCA Chassis**	Six AMC.0 Single Module, Mid-size Slots
Standards		
AMC	**Type**	AMC.0, AMC.1, AMC.2, AMC.3 and AMC.4
MTCA	**Type**	PICMG 3.0 Rev 3.0
Configuration		
Power	**VT955**	AC Universal 500W
		DC -36V to -75V (460W) or +18V to +36V (400W)
Environmental	**Temperature**	See Ordering Options
		Storage Temperature: –40° to +85°C
	Altitude	10,000 ft operating
		40,000 ft non-operating
	Relative Humidity	5 to 95% non-condensing
Cooling		Front to Back
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		One (1) year, 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

VT955 – ABC-DE0-0HJ

A = Power Supply	D = Clock Holdover Stability	
0 = AC Universal 500W 1 = DC -36 to -75V (460W) 2 = DC 18 to 36V (400W)	0 = Standard (XO) 1 = Stratum-3 (TCXO)	
B = JTAG Switch Module	**E = JTAG Virtual Probe**	**H = Temperature Range**
0 = No JSM 1 = JSM	0 = No JTAG Virtual Probe 1 = JTAG Virtual Probe	0 = Commercial 1 = Industrial
C = Front Panel Clocking		**J = Conformal Coating**
0 = None *(Backplane Clocking only)* 1 = Dual LVCMOS Clock In/Out 2 = Sine Wave In + LVCMOS In/Out 3 = Built-in GPS receiver + LVCMOS In/Out 4 = Dual Sine Wave In 5 = GPS receiver + Sine Wave In		0 = No coating 1 = Humiseal 1A33 Polyurethane 2 = Humiseal 1B31 Acrylic

Related Products

VT872

- MTCA.3 Conduction Cooled System Platform
- Up to 6 mid-size AMCs
- High-speed routing on 26 layers

AMC515

- AMC FPGA carrier for FPGA Mezzanine Card (FMC) per VITA 57
- AMC Ports 4-11 are routed to FPGA (protocols such as PCIe, SRIO, XAUI, etc. are FPGA programmable)
- Xilinx Virtex-7 XC7V2000T in 1925 package

FMC223

- FMC per VITA 57
- Single module AD9739 DAC 14-bit at 2.5 GSPS
- 2 Vpp differential Analog output swing

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