VT954

1U MTCA Chassis with 6 AMC Slots, 10/40GbE, Dual PSU

VT954

Key Features

- Compliant to MIL-STD-810F, MIL-STD-901D for shock/vibration
- Compliant to MIL-STD-461E for EMI
- Supports up to six single mid-size modules
- Front to back airflow
- Full Layer 2 or 3 managed Ethernet switch
- Dual 10/40GbE and dual GbE per AMC Slot
- Management can run as Shelf/MCMC or MicroTCA Carrier Management Controller (MCMC)
- AMC.2, AMC.3 and AMC.4 compliant

Benefits

- Ruggedized 1U chassis in 19" rackmount
- Design utilizes proven VadaTech subcomponents and engineering techniques
- Electrical, mechanical, software, and system-level expertise in house
- AS9100 and ISO9001 certified company
- Full system supply from industry leader

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VT954

The VT954 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. The unit offers dual redundant PSUs, hot-swappable from the rear of the chassis. To assist with front panel retention a single MicroTCA.1 screw is fitted opposite the hot-swap ejector handle on each module slot.

The front-to-rear cooled chassis utilizes the VadaTech 3rd generation MCH (UTC004) for its shelf manager, crossbar clocking for low jitter, GPS/IEEE1588/SyncE/NTP, etc.

The VT954 has dual 10/40GbE and dual GbE to each slot. There are also dual QSFP+ to the front panel. The backplane provides direct connection between adjacent AMC slots on Ports 2-3 and on Ports 12-20.

Figure 1: VT954 Chassis Front View

Power Supplies

The VT954 offers dual redundant AC or DC power supplies that are hot pluggable from the rear of the chassis.

Cooling and Temperature Sensors

The VT954 has intelligent Cooling Units that are built into the removable power supply trays. The cooling airflow is from front to back. Temperature sensors throughout the chassis monitor intake and outtake air temperature.

Base/Fabric Channel Ethernet Switch

The VT954 provides a standard GbE base channel switch which includes two 40GbE uplinks. 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.

Figure 2: VT954 Chassis Rear View

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.

GPS and General-Purpose Clocks

The MTCA specification defines a set of clocks for telecom and non-telecom applications. The VadaTech VT954 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 VT954 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 VT954 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 VT954 can be ordered with a GPS Receiver option. The receiver disciplines an onboard high-quality DPLL which is phase/frequency aligned to the atomic clocks in the GPS satellite constellation. The onboard 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 VT954 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 provides a precision Time-stamping Engine capability via GbE on the backplane. This engine appears as a GbE 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 VT954 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 onboard disciplined oscillator.

Synchronous Ethernet

The VT954 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 VT954 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 VT954. 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 3: Single Latching Flange Panel (example)

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

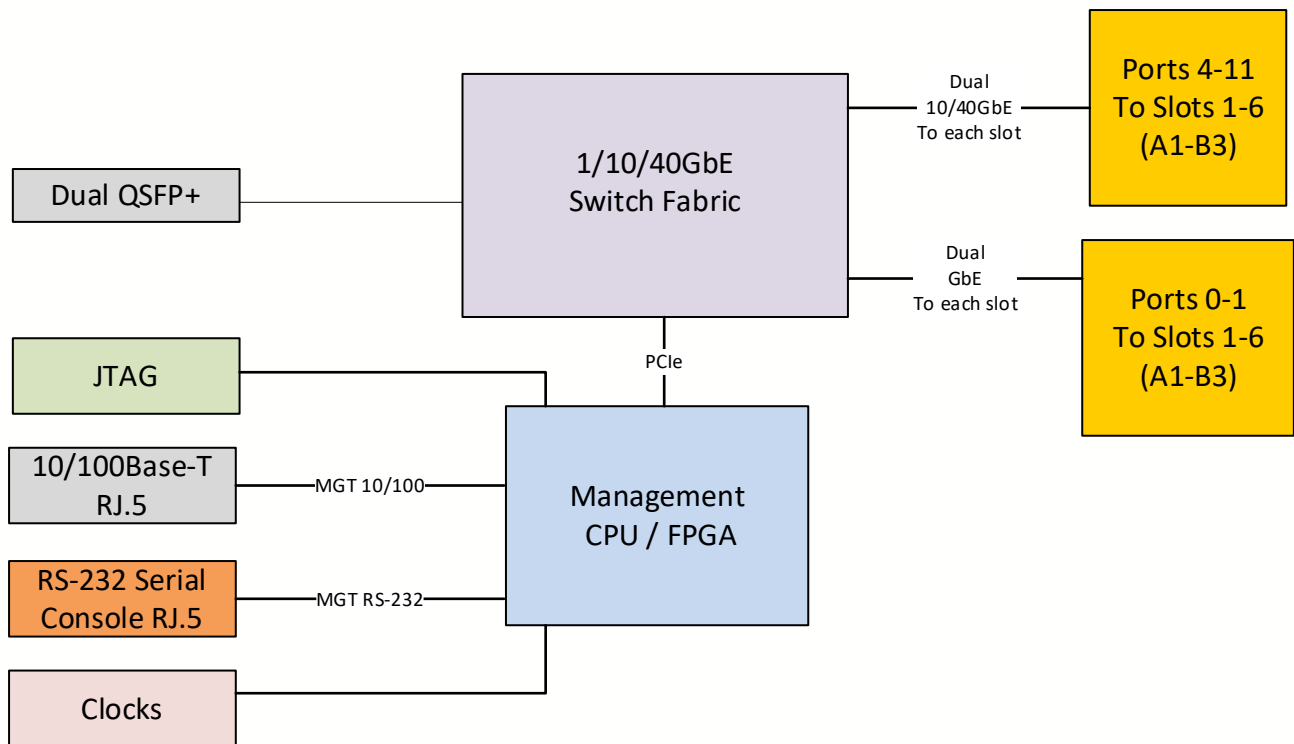*Figure 4: Latching Tab for Standard MTCA.0 AMC*

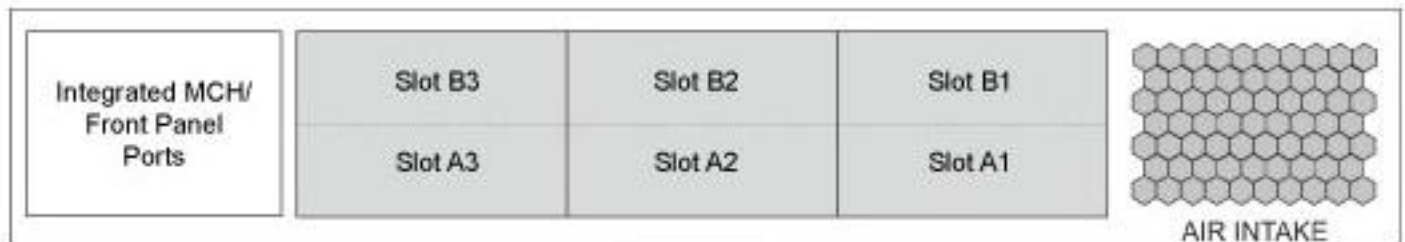# Block Diagram

Figure 5: VT954 Block Diagram
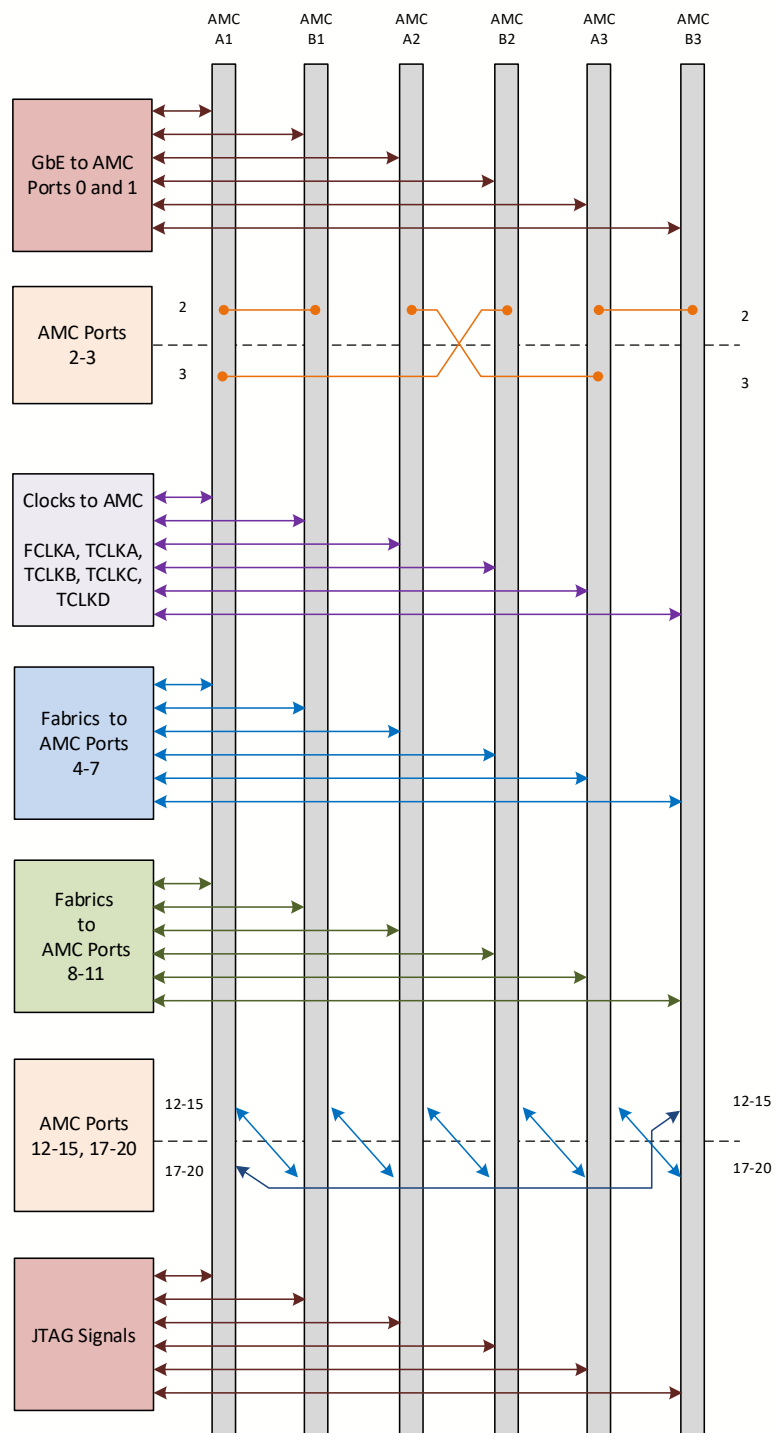
Chassis Layout

Figure 6: VT954 Front Panel

VT954 – 1U MTCA Chassis with 6 AMC Slots, 10/40GbE, Dual PSU

Backplane Connections

Figure 7: VT954 Backplane Connections

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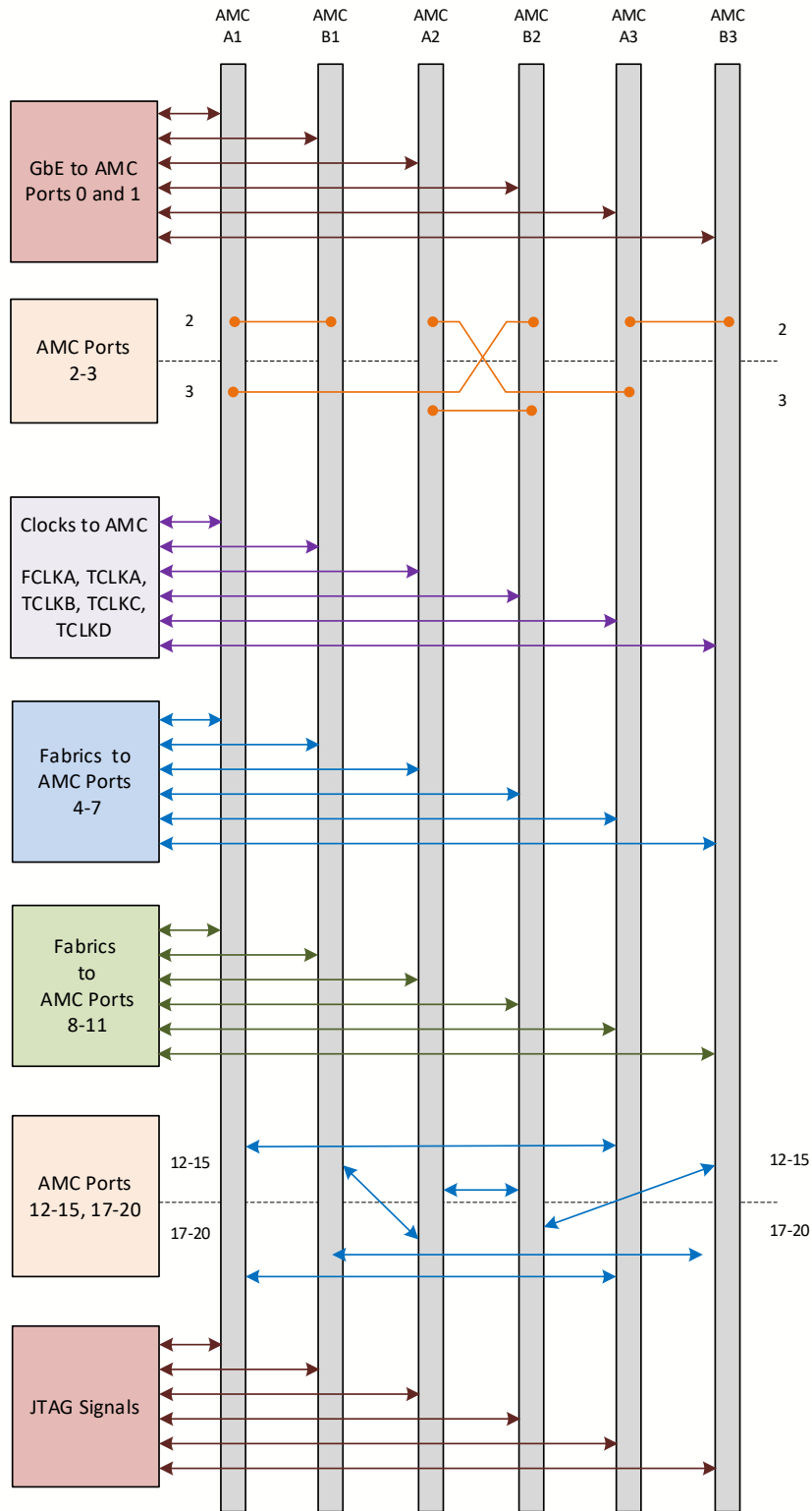
Figure 7A: VT954 Backplane Connections

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Specifications

Architecture		
Physical	**Dimensions**	Width: 19"
		Depth: 21.5"
		Height: 1U
Type	**MTCA Chassis**	6 AMC.0 single module, (mid-size slots)
Standards		
AMC	**Type**	AMC.0, AMC.2, AMC.3 and AMC.4
MTCA	**Type**	PICMG 3.0 Rev 3.0
Configuration		
Power	**VT954**	Single or dual 500W, Universal AC
		Single or dual 460W, DC -36V to -75V or +18V to +36V
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 ISO9001:2015 and AS9100D 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

VT954 – ABC-DEF-0HJ

A = Power Supply	D = Clock Holdover Stability	
0 = AC Universal 500W, dual PSU 1 = AC Universal 500W, single PSU 2 = DC -36V to -75V, 460W, dual PSU 3 = DC -36V to -75V, 460W, single PSU	0 = Standard (XO) 1 = Stratum-3 (TCXO)	

B = JSM	E = JTAG Virtual Probe	H = Temperature Range
0 = No JSM 1 = JSM	0 = No JTAG Virtual Probe 1 = JTAG Virtual Probe	0 = Commercial (-5° to 70°C) 1 = Industrial

C = Front Panel Clocking	F = Back plane routing	J = Conformal Coating
0 = No FP Clocking (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 6 = Sine Wave In (up to 17dBm) +TTL/LVCMOS In	0 = Figure 7 1 = Figure 7A	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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