Amphenol
Ruggedized VME64x, VITA 60, 66 Interconnects

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Amphenol Ruggedized VME64x & VITA 60/ VITA 66 Interconnects

VME & VITA Typical Markets:

- Military & Commercial Avionics
- Military Vehicles
- Missiles/Ordnance
- Missile Defense
- C4ISR
- Radar

Amphenol Aerospace

FOR ATTACHMENT TO VME64X PRINTED CIRCUIT BOARDS

Amphenol Aerospace developed the Ruggedized VME64x in response to the military trend towards VME64x and the utilization of COTS Boards and Chassis.

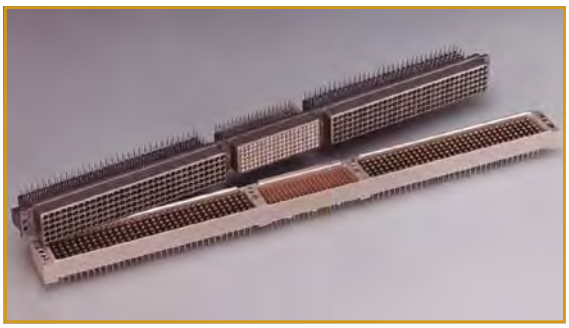
Many different companies manufacture “Ruggedized VME cards”, but they still use the standard VME COTS (Commercial Off The Shelf) connector interface. In a harsh militaryenvironment the COTS VME connector interface can fail, negating the ruggedization of the cards.

The Amphenol Ruggedized VME64x interconnect has a more rugged interface than standard connectors for improved vibration durability. It meets the needs for a harsh environment connector requiring Level 2 maintenance. Military and commercial aviation, military vehicles and GPS systems are examples of markets that need the ruggedized VME64x connector solution from Amphenol.

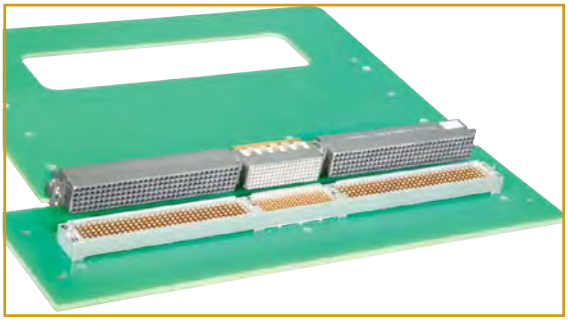
The Amphenol Ruggedized VME64x connector mounts to standard VME64x cards and backplanes, but it does not mate to other types of VME commercial connectors.

Features and benefits include:

- Metal shells - mount directly to the standard VME card mounting holes, providing support and protection to the inserts in the module and additional stiffness to the backplane
- The metal shells create a faraday cage around the contacts, preventing ESD (Electrostatic Discharge) into the contacts (module only)
- Robust contact system
- 3 module inserts in one unified shell; each can have different interconnect combinations:
  - P1, P2 and 2mm electrical P0
  - P1 and P2 combination
  - P1, P2 and fiber optic MT ferrules in the P0 position
- Inserts are designed to customer specifications
- Thru-hole solder tail or solderless termination is available on the backplane connector.



Amphenol’s ruggedized VME64x module and backplane connectors were developed to meet more rugged harsh environment applications.

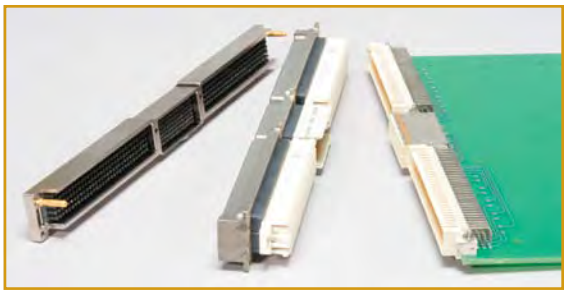


Ruggedized VME64x module and backplane connectors on a circuit board.

Ruggedized VME64x Adapter with Brush Contacts

“Cocooning” of COTS components has been successful in military applications. Amphenol supplies an adapter interconnect system for “cocooning” of COTS VME64x daughtercards.

The ruggedized VME64x adapter system provides the durable brush contact as the primary interface, and integrates the three connectors into a singular metal shell, providing passive ESD protection to the module connector. The back of the module connector mates to standard COTS VME64x daughtercards, isolating them from harsh environments.



Ruggedized VME64x backplane (left), and module adapter (center) and a typical COTS VME64x circuit board (right).

New/Featured Product

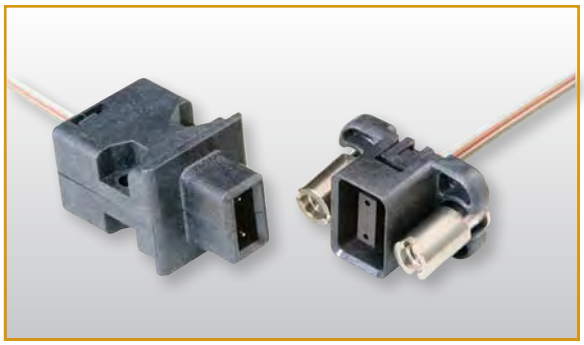
VME P0/J0 Fiber Optic Interconnects

Amphenol provides a fiber optic interconnect for attachment to standard VME-64x cards and backplanes for the P0 and J0 locations of the boards. It uses "MT" ferrules and it is used in place of P0/J0 electrical applicable connectors. MT ferrules are not supplied by Amphenol. Connectors are supplied less the MT ferrules.

Performance features include:

- Tested to IEEE 1156.1-1993
- Operating temperature from –55°C to +125°C
- Shock: 100g, 6ms, 1/2 sine, 18 pulses
  Shock: 30g, 6ms, 1/2 sine, 18 pulses
- Sine vibration: 10g, 40 min./axis, 3 axis
- Random vibration: 0.15g^2 Hz, 40 min./axis, 2 axis
- ESD: 15KV/150 pF

Amphenol's VME P0/J0 fiber optic connectors are used in military and commercial aviation, military vehicles and GPS systems. They are designed to customer specifications. Consult Amphenol Aerospace for further information.



VME P0/J0 Connectors with MT ferrule fiber optics

VME P0/J0 Module MT Connector Part Number	VME P0/J0 Backplane MT Connector Part Number
10-509050-011	10-509050-041

VITA-66.1 Fiber Optic Interconnects

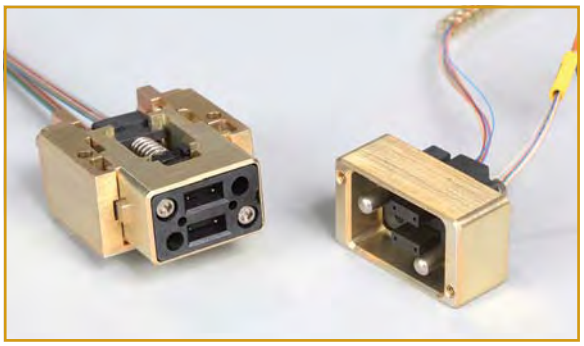
Amphenol's proposed VITA-66.1* MT connector provides a reliable high speed connection for the most extreme commercial and military environments.

This ruggedized interconnect is among the highest density of connector products on the market.

MT ferrules can be accommodated as follows:

- Up to 24 fiber optic channels per MT ferrule
- Up to 48 channels per connector

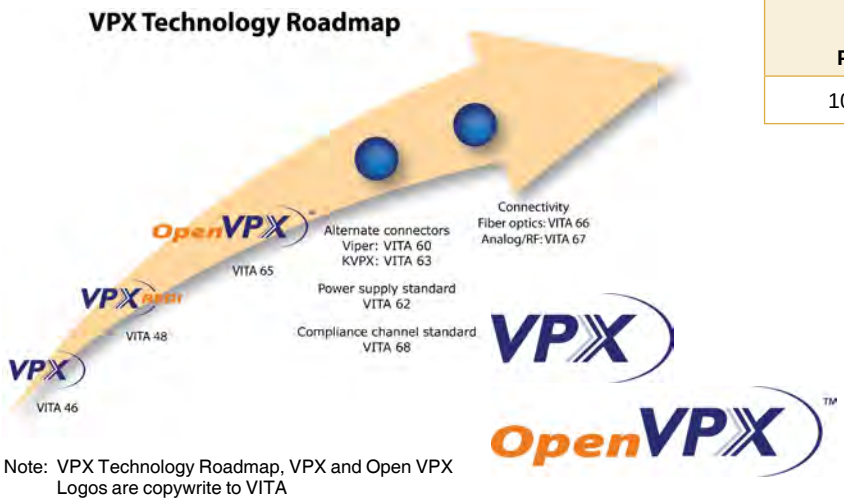
MT ferrules are not supplied by Amphenol. Connectors are supplied less the MT ferrules.



VITA-66.1 Connectors with MT ferrule fiber optics

VITA-66 Connectors	
Module MT Connector Part Number	Backplane MT Connector Part Number
10-504637-004	10-504639-002

Amphenol's VITA 66.1 Interconnect is Designed in accordance with the VPX Technology Roadmap



Note: VPX Technology Roadmap, VPX and Open VPX Logos are copywrite to VITA

* VITA-66 supersedes VITA-46.

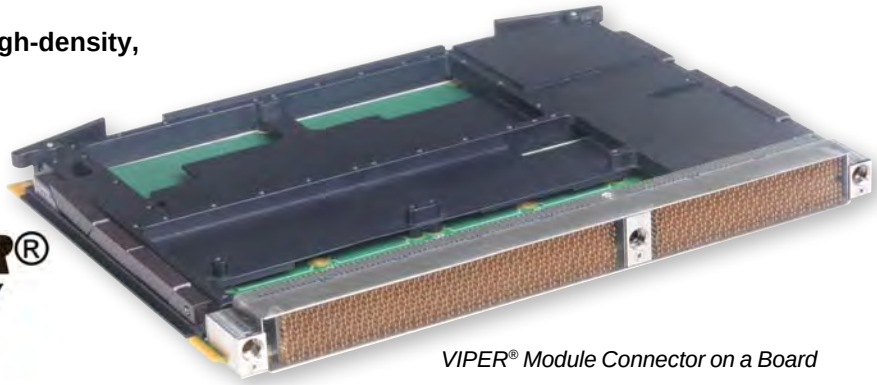
VITA 46, VITA 48 & VITA 60 FOOTPRINT COMPATIBLE

New/Featured Product

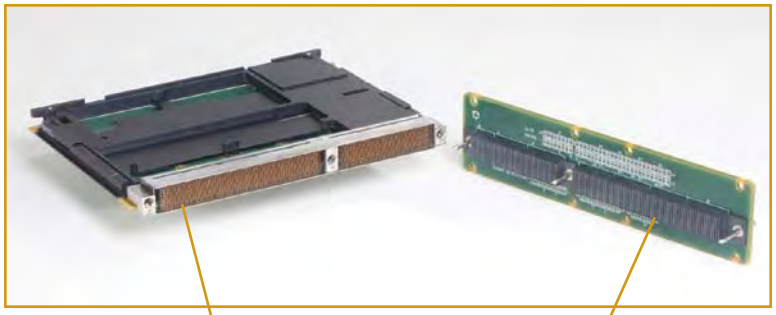
The VIPER® Connector is a shielded, high-density, high speed modular interconnect with press-fit termination.

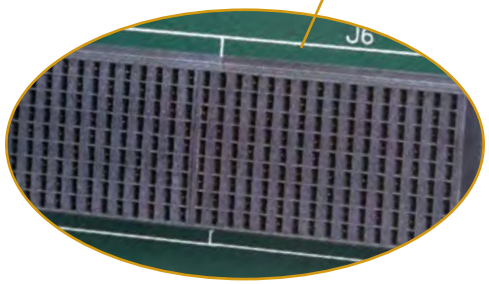
Amphenol Backplane Systems* developed the VIPER interconnect platform to meet or exceed future avionic high-level requirements such as:

- High-level vibration and mechanical shock protection
- Condensing moisture resistance
- Ruggedization in packaging that can scale to higher bandwidths without costly and time-consuming chassis redesigns. The VIPER connector platform offers the ability to scale from 80 Mbps to over 10 Gb/s while retaining the same Vita 46 platform slot pitch at 20.3mm to 25.4mm.

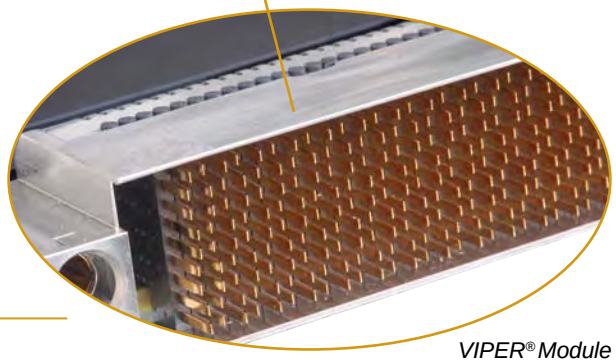


VIPER® Module Connector on a Board





VIPER® Backplane Closeup



VIPER® Module Closeup

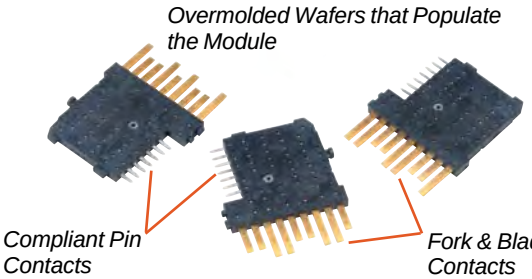
Key Features of VIPER®

- Fully footprint-compatible with VITA 46 and VITA 48 standards
- Hi-Speed: the VIPER is designed for 10 + Gb/s data rate performance
- 100 ohm impedance for differential pair configuration
- The daughtercard assembly is optimized for differential pair architecture on a 1.8mm x 1.35mm grid.
- The daughtercard is waferized, and provides single-ended and power wafer options integrated onto a stainless steel stiffener with stainless steel frame** and keying elements
- The backplane has signal contacts that incorporate a highly reliable 4-point-of-contact beam design, and ground contacts which are robust compliant pin & contact fork design
- ±0.52mm nom. translation in fully mated condition
- ESD protection supports 2-level maintenance designs
- Flexible modular design is ideal for standard 3U and 6U applications, as well as unique custom configurations incorporating RF and fiber optic MT solutions

Amphenol's VIPER® Interconnect is Designed in accordance with the VPX Technology Roadmap

VPX

OpenVPX™



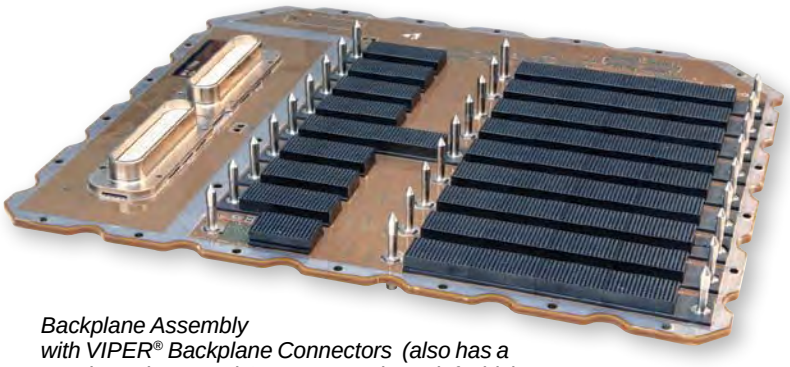
* Consult Amphenol Backplane Systems for more information on VIPER® Interconnects:
Amphenol Backplane Systems, 18 Celina Avenue, Nashua, NH 03063
Phone: 603-883-5100. Website: www.amphenol-abs.com

** Light-weight alternative available; consult Amphenol Backplane Systems.

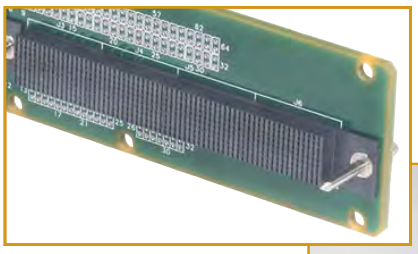
New/Featured Product

VIPER® Electrical Specifications

- Data Rate: 10 Gbps
- Differential Impedance: 100 ohms
- Differential Insertion Loss: –5 dB up to 5 GHz (10 Gbps)
- Differential Return Loss: – 5 dB up to 5 GHz (10 Gbps)
- Far End Crosstalk: –35 dB up to 8 GHz
- Near End Crosstalk: –33 dB up to 8 GHz
- Signal Contacts: 1 amp
- Power Wafer: 12 amps per wafer at 30° C T-Rise
- Compliant Pin to Plated Through Hole Resistance: 1 milliohm max
- Dielectric Withstanding Voltage: 500 volts RMS
- Insulation Resistance: 1000 megohms



Backplane Assembly with VIPER® Backplane Connectors (also has a Brush Rack & Panel Connector Pair on left side)*



One VIPER® Backplane on a Board

VIPER® Mechanical Specifications

- Signal and Ground Contact:
  - Normal Force: 85 grams per beam
  - Engagement force: 45 grams max, 35 grams typical
  - Separation force: 30 grams max, 25 grams typical
  - Durability: 500 cycles minimum
- Backplane Signal and Ground Compliant Pin:
  - Insertion Force: 4.9 kilograms maximum; 1.5 kilograms to 4.9 kilograms depending on the surface finish of PCB
  - Retention Force: 1.4 kilograms minimum
- Daughtercard Wafer Compliant Pin:
  - Insertion Force: 1.8 kilograms to 3.6 kilograms depending on the surface finish of PCB
  - Retention Force: 1.6 kilograms minimum
- Radial hole wall deformation: 0.04mm per side measured from drilled hole
- Axial hole wall deformation: 0.03mm measured in the vertical plane
- Translation: ±0.52mm nom. fully mated
- Slot Pitch: 20.30mm

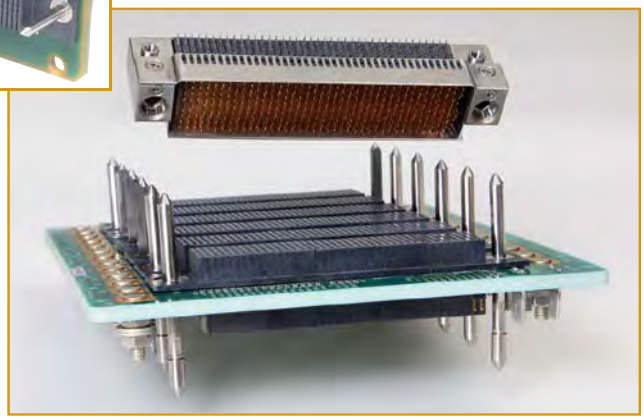
VIPER® Environmental Specifications

- Temperature: ›55°C to 125°C
- Random Vibration: 90 minutes per X, Y and Z axis at 0.6 G^2/Hz
- Mechanical Shock: 50 G'rms in Y axis, 80 G'rms in X and Z axis, 11 milliseconds, half sine
- Temperature Life: 1000 hours at 125°C

Printed Circuit Board Specifications

- Minimum Backplane and Daughtercard thickness: 1.85mm and 1.53mm
- Daughtercard pattern primary drilled hole size: 0.55mm
- Daughtercard pattern finished hole size: 0.46 ±0.05mm
- Backplane pattern primary drilled hole size: 0.65mm
- Backplane pattern finished hole size: 0.56 ±0.05mm

* See pages 96-98 for Amphenol Rack and Panel Connectors with Brush contacts.



Six VIPER® Backplane Connectors on a Board and one Mating Viper® Module above

VIPER® Materials and Finishes

Backplane Signal and Ground Contacts: C7025 copper alloy, 0.23mm. Finish is 0.00127mm nickel minimum all over per SAE-AMS-QQ-N-290, Class I. Selective 0.00127mm gold minimum per ASTM-B488, Type II, Grade C, Class 1.27 in the mating area. 0.0076mm 60/40 reflowed tin/lead minimum selectively plated in the compliant pin area.

Differential, Power, and Single-ended Daughtercard Wafer Leadframes: C7025 copper alloy, 0.38mm. Finish is 0.00127mm nickel minimum all over per SAEAMS-QQ-N-290, class I. Selective 0.00127 gold minimum per ASTM-B488, Type II, Grade C, Class 1.27 in the mating area. 0.0076mm 60/40 reflowed tin/lead minimum selectively plated in the compliant pin area.

Backplane Insulators and Daughtercard Wafer Insert Mold Material: Glass reinforced polyester (Liquid Crystal Polymer), UL 94V-0, color black.

Front and Rear Stiffeners: Stainless steel, 0.6mm, Type 301, 1/2 Hard. finish per Mill 2B.

Backplane Guide Pin: Stainless steel, Type 303, passivated.

Daughtercard Connector Header and Keying Components:** Stainless steel, Type 440, passivated.

** Light-weight aluminum header version is available. Consult Amphenol Backplane Systems.