



Board-Level Interconnects for Rugged Embedded Computing



The Specialist in Electronic
Component Distribution





TABLE OF CONTENTS

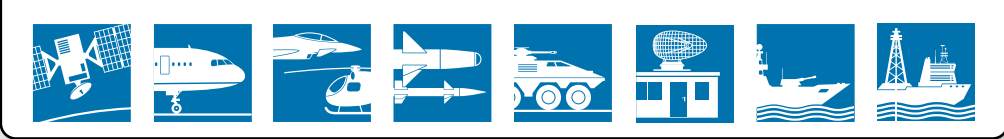
Introduction	3
VITA 46: MULTIGIG RT 2 and MULTIGIG RT 2-R Connectors	5
VITA 66: Optical Modules	8
VITA 67: RF Modules	9
VITA 61: Mezalok Connectors	10
VITA 62: MULTI-BEAM XLE Power Connectors	11
Next-Generation Connectivity: Fortis Zd Connectors	12
Complete Solutions for Embedded Computing	14

TE Components . . . TE Technology . . . TE Know-how . . .

Get your product to market faster with a smarter, better solution.

**Go to: DesignSmarterFaster.com.
Your best place to get started, today!**

Here you can get connected to the inner circle of TE AD&M's best thinkers. Working together early in your design review process, we can help you reach a better connectivity solution.



SWAP:

REDUCE SIZE AND WEIGHT

INCREASE POWER, DATA AND BANDWIDTH

SPEED DESIGN WITH OPEN ARCHITECTURE SOLUTIONS

Next-generation processors need next-generation connectivity to keep pace with the growing demand for bandwidth even as space, weight, and power savings become critical.

TE Connectivity (TE) has been pushing the bandwidth envelope by adapting high-speed commercial technology and combining it with our expertise in rugged packaging. The results are board-level interconnects that give you more performance in harsh military and aerospace applications.

Beyond speed, we are also reducing size through higher connect densities and supporting RF and optical interconnects at the board level. And to allow compact, high-speed box-to-box connectivity, we have a full range of I/O connectors supporting rates to 10 Gb/s.

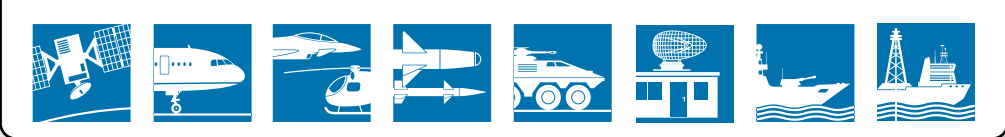
We are meeting the demanding needs of battlespaces with ruggedized copper and fiber interconnect and cable assemblies. And we are helping to protect systems with lightweight shielding and EMI-immune datapaths.

TE is focusing our technology to minimize size, weight and power consumption, to increase bandwidth, and to enable open architecture systems.

More Performance for Land, Sea, Air, and Space

- Avionics and Vetrronics
- Communications Hubs and Processing
- Electronic Warfare and Countermeasure Management
- Two-Level Maintenance and ESD Sensitive Applications
- Mobile and Fixed Satellite Terminals and Ground Base Stations
- Power Supply and Distribution
- Radar Interface and Processing - RF and Digital
- Sensor Array Hubs and Data Processing
- Vehicle Mission Computers and Navigation
- Weapons Control and Targeting





VPX COMPLIANT SOLUTIONS

As the latest standard architecture evolving from VMEbus, the VPX standard meets the needs for data-intensive processing in the aerospace and defense industries, where both ruggedness and high-speed performance are crucial. Supporting 6.25 Gb/s in a switched fabric architecture, VPX systems are designed for flexible application of demanding high-speed protocols, such as 10G Ethernet, RapidIO, InfiniBand, and HyperTransport, in ground, aerospace, and marine applications.

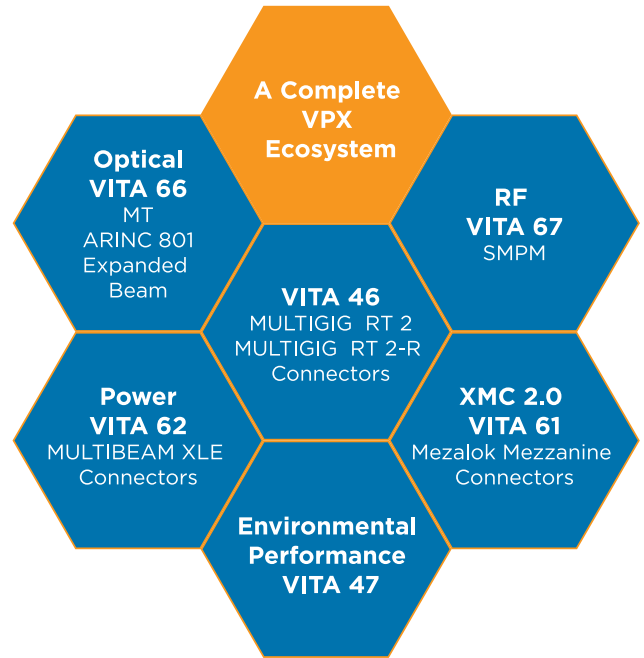
VPX systems are highly scalable and flexible, supporting both 3U and 6U formats to meet the widest range of needs. The VITA 46 VPX backplane uses the TE 7-row MULTIGIG RT 2 connector system to support both single-ended and differential signals.

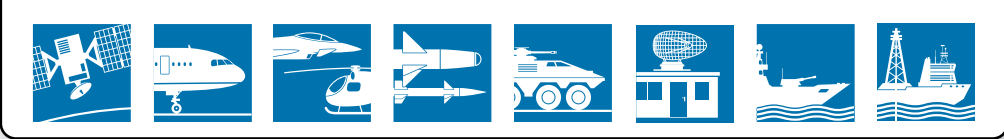
As a widely used standard, VPX promotes interoperability, a healthy choice of suppliers, and economies of scale that result from higher board volumes.

Not only does VPX accommodate new technologies, it has expanded beyond backplane/daughterboard signaling to embrace mezzanine application, power modules, and optical and RF connectivity—all with the goal of providing unmatched flexibility and capabilities for embedded computing.

HIGH SPEEDS, MULTIMEDIA, MAXIMUM FLEXIBILITY

TE's portfolio of VPX systems gives you a complete array for high-speed data, optical, RF, power, and mezzanine connectivity. More choice means more flexibility in achieving specific system architectures with standards-based solutions. Get the high-speed signal integrity advanced applications require in rugged, reliable connectors.





**VITA 46
MULTIGIG RT 2 and MULTIGIG RT 2-R Connectors**

Modular Connector System with Data Rates up to 10 Gb/s

The MULTIGIG RT 2 connector, the standard for VITA 46, represents a huge step forward in the world of rugged computing and C4ISR enabling technology.

Flexible

The modular connector system features a protected backplane connector and uses a pinless backplane and wafer-based design in place of pin contacts. Wafers, available for differential, single-ended, and power needs, can be easily modified to support specific customer needs for characteristic impedance, propagation delay, and other electrical parameters. The connector system also offers built in ESD features enabling field serviceability, is extremely light weight and is fully qualified for VITA 47 environments.

Fast

MULTIGIG RT 2 connectors support speeds up to 10 Gb/s, providing a comfortable performance margin in VPX applications.

Ultra-Rugged MULTIGIG RT 2-R Connectors

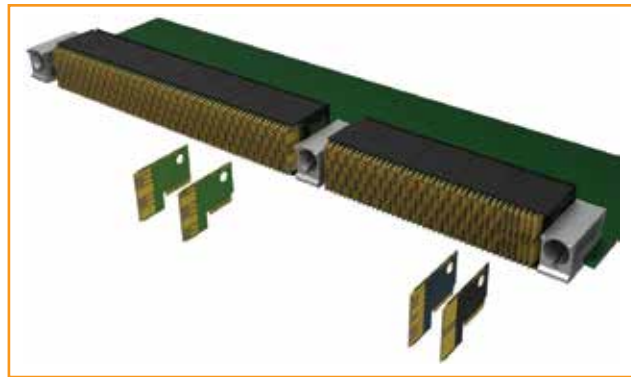
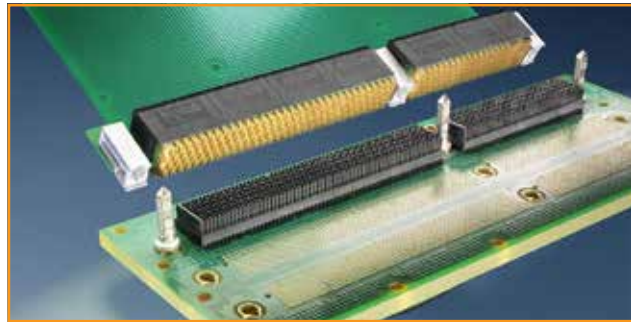
MULTIGIG RT 2-R connectors meet application needs beyond VITA 47 environmental performance, while leveraging all the technical and economic benefits of VITA 46 VPX.

Quad-Redundant Contact System rather than the two points of the existing MULTIGIG RT 2 connector. Increasing the points of redundancy increases reliability in a high vibration environment.

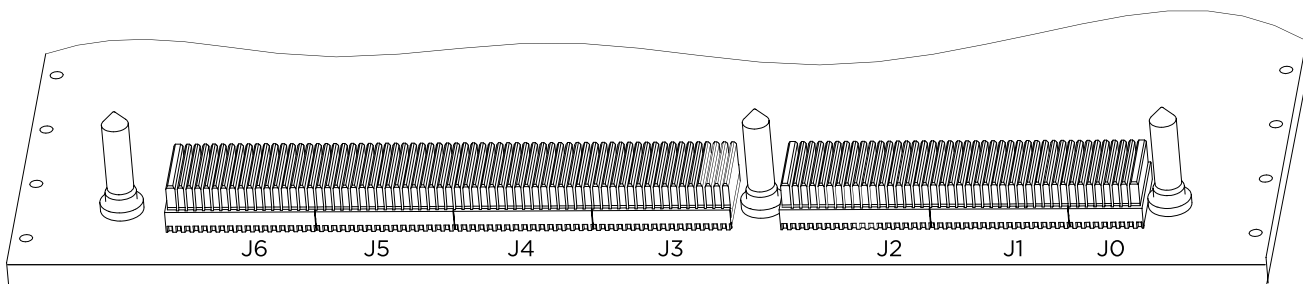
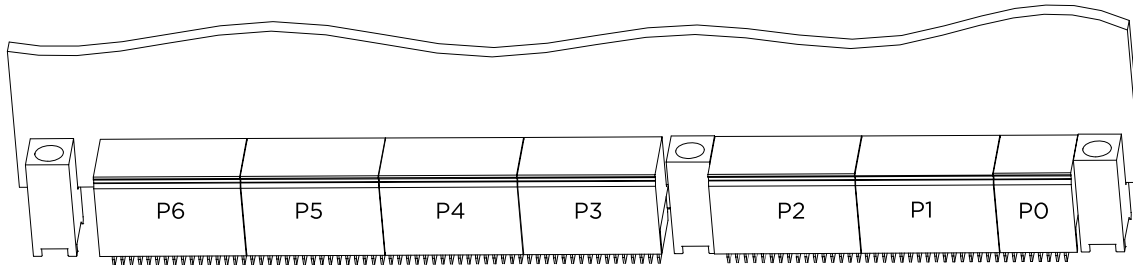
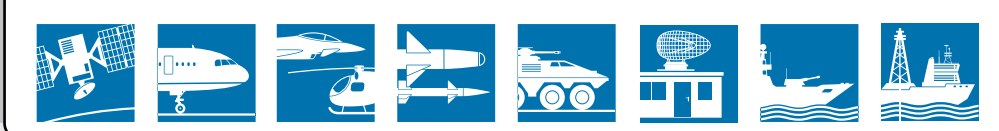
Backward Compatibility to all existing VITA 46 daughtercards.

“Pinless” Interface tested to 10,000 mating/unmating cycles.

Rugged Survivability beyond VITA 47 high level shock and vibration. The connector has been “torture tested,” exposing a 6U VITA 46 VPX test unit to Random Vibration levels of 0.2 g²/Hz for 12 hours.



- 1-Gb/s performance in a lightweight, high-density connector
- Differential, single-ended, and power contacts
- Backplane connector system with “pinless” interface
- Customizable impedance-matched printed circuit wafer interface
- Superior crosstalk performance
- Optimized footprints for signal integrity and ease of board design
- Three levels of signal contact sequencing
- Available for 0.80” or 1.00” card pitch systems
- Density up to 140 signals per inch



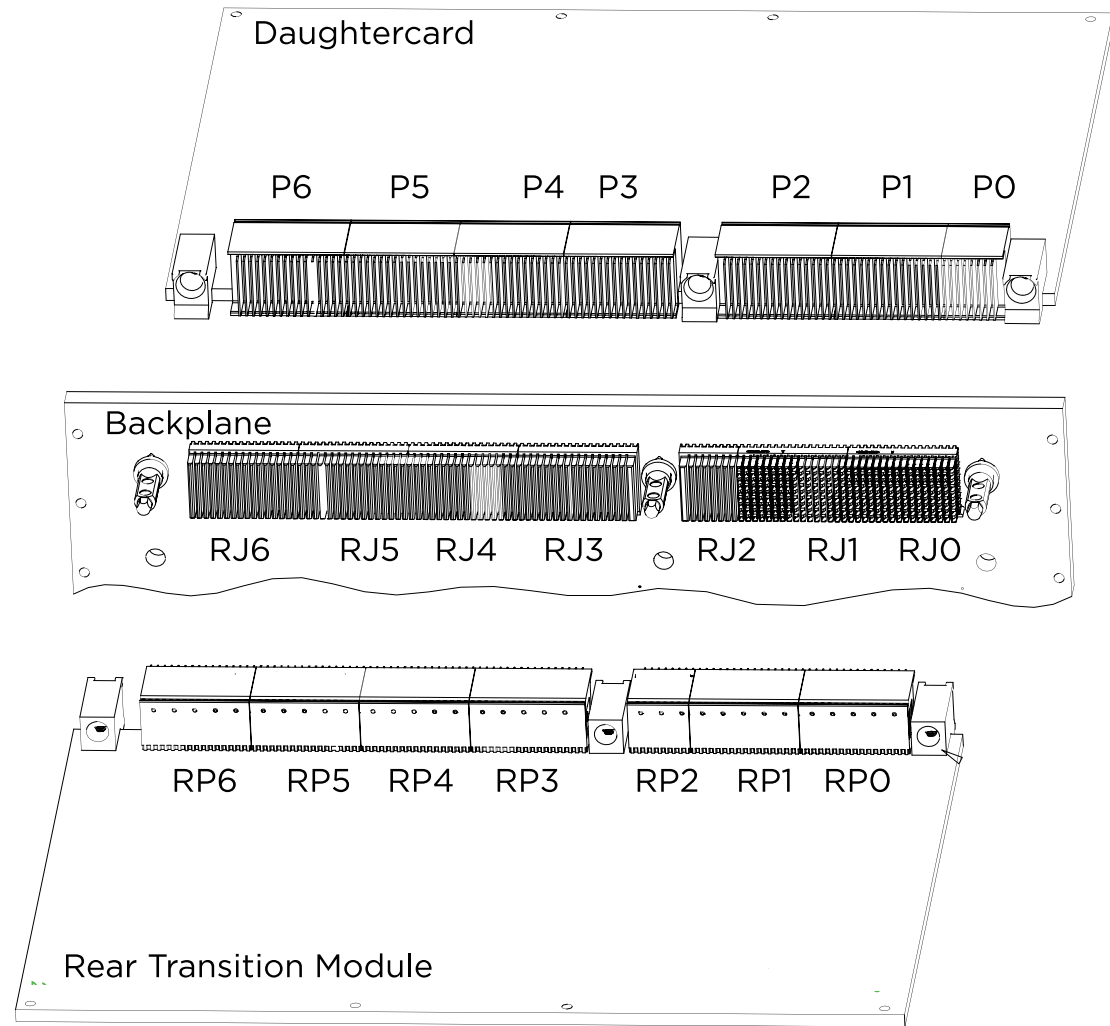
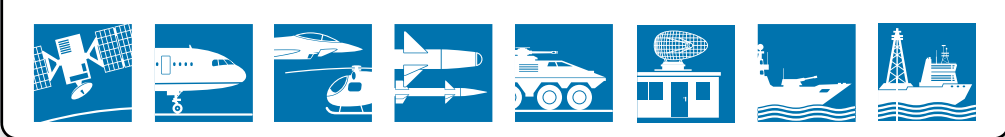
DAUGHTERCARD

Module Position	Part No.	
	MULTIGIG RT 2	MULTIGIG RT 2-R
P0	1410189-3	2102772-1
P1, P2, P3, P4, P5, P6	Differential	1410187-3
	Single-Ended	1410190-3
Keying Guide Socket Modules	1-1469492-X (Standard Zinc Die Cast)	2000713-X (Machined 6061 Aluminum with ESD Contact)

BACKPLANE

Module Position	Part No.	
	MULTIGIG RT 2	MULTIGIG RT 2-R
J0	1410186-1	2102735-1
J1, J3, J4, J5	1410140-1	2102736-1
J2, J6	1410142-1	2102737-1
Keying Guide Pin	1-1469491-X (Standard Zinc Die Cast)	2000676-X (Stainless Steel)

See TE drawings for guide module and pin options.



REAR TRANSITION MODULE

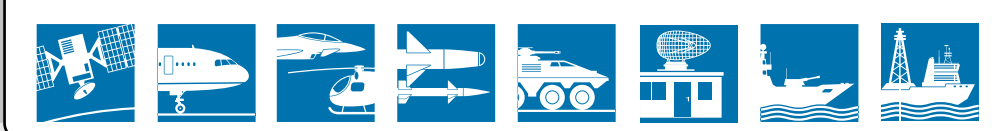
Module Position	Part No.		
	MULTIGIG RT 2	MULTIGIG RT 2-R	
RP0	1410968-3	2102773-1	
RP1	Differential	1410975-3	2102774-1
	Single-Ended	1410970-3	2102849-1
RP2	Differential	1410971-3	2102775-1
	Single-Ended	1410972-3	2102848-1
RP3, RP4, RP5, RP6	Differential	1410975-3	2102774-1
	Single-Ended	1410190-3	2102847-1
Keying Guide Socket Modules	1-1469492-X (Standard Zinc Die Cast)	2000713-X (Machined 6061 Aluminum with ESD Contact)	

REAR TRANSITION BACKPLANE

Module Position	Part No.		
	MULTIGIG RT 2	MULTIGIG RT 2-R	
RJ0	See Note 1	1410964-1	2102768-1
	See Note 2	1410965-1	2102850-1
RJ1	See Note 3	1410140-1	2102736-1
	See Note 4	1410966-1	2102851-1
RJ2	1410186-1	2102735-1	
RJ3	1410142-1	2102737-1	
RJ4, RJ5, RJ6	1410140-1	2102736-1	
Keying Guide Pin	1410956-1 (Standard Zinc Die Cast)	2226127-1 (Stainless Steel)	

Notes (Reference VITA 46.10; Observation 3-6):
 Note 1: 16 column shell, 15 columns of contacts
 Note 2: 16 column shell, 7 columns of contacts present (plus contacts i9-16)
 Note 3: 16 column shell, 16 columns of contacts
 Note 4: 16 column shell, 8 columns of contacts present (plus contacts i1-8)





**VITA 66
Optical Modules**

The VITA 66 standard, for optics, gives you the choice of MT array connectors, ARINC 801 termini, or expanded beam (EB) contacts using a common module. With an aerospace pedigree, each style of termini offers different benefits in terms of density, ruggedness, reparability, and other characteristics.

MT ferrules

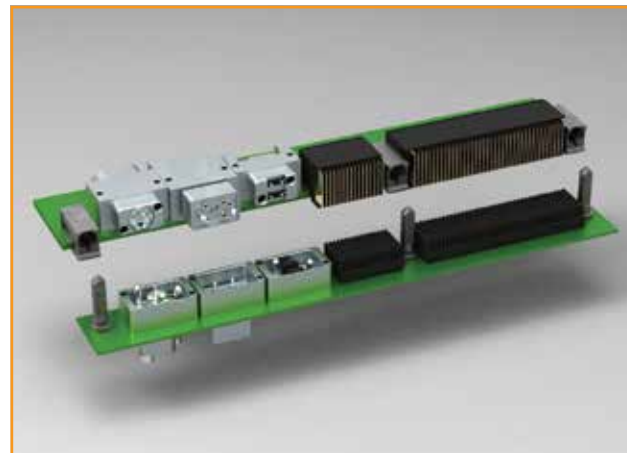
- Highest-density interconnection
- Up to 48 fibers in a 3U system
- Up to 240 fibers in a 6U system

ARINC 801 termini

- Industry-standard 1.25 mm ceramic ferrules
- Physical contact technology for very low insertion loss, with angled polishes
- Keyed orientation for optimal single-mode performance

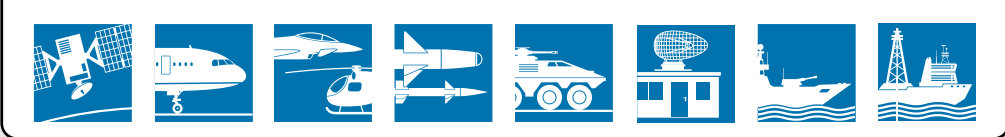
Expanded beam termini

- Up to four fibers per module
- Ball lens to tolerate less than pristine conditions
- Excellent for handling shock, vibration, or repeated mating/unmating
- Well suited to two-level maintenance or applications calling for frequent insertion/extraction



Interface	Part No.	
	Backplane	Daughtercard
VITA 66.1: MT	2000973-1	2000974-1
VITA 66.2: ARINC 801	—	—
VITA 66.3: Expanded Beam	2102282-1	2102283-1
MT Ferrule Kit (12 Fiber, Multimode)	2102866-1	2102866-2

Contact TE about availability and additional fiber assemblies.



**VITA 67
RF Modules**

- Modular design with 4- or 8-position modules for application-specific configuration
- Modules available in stainless steel and aluminum
- Float-mounted jack maintains positive RF connection
- Excellent channel-to-channel isolation
- Will support 0.80" card pitch
- .240" center-to-center contact spacing
- SMPM-based contact performance to 40.0 GHz
- RF contacts are available for a variety of cables



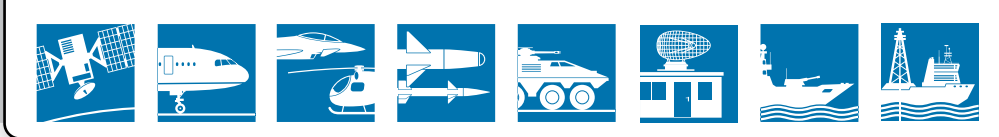
VITA 67 MODULES

	Contact Type	Part No.	
		4 Position	8 Position
Daughtercard		1996706-1	1996705-4
Backplane	SMPM plug	1996884-1	1996883-4
	OSMM jack	2101510-2	1996777-2
	Direct Attach cable	—	2157553-1

RF CONTACTS

	Cable Type*	Part No.
Daughtercard	.047" Dia.	1996771-1
	.086" Dia.	1996390-1
Backplane (for Direct Attach cable)	.047" Dia.	2157248-1
	.086" Dia.	2101012-1

*Semirigid cable or flex equivalent.

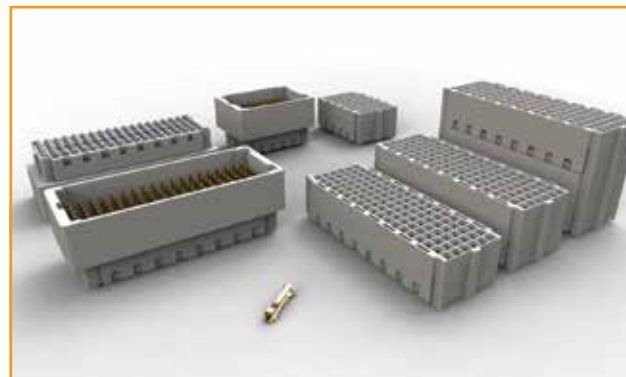


**VITA 61
Mezalk Connectors**

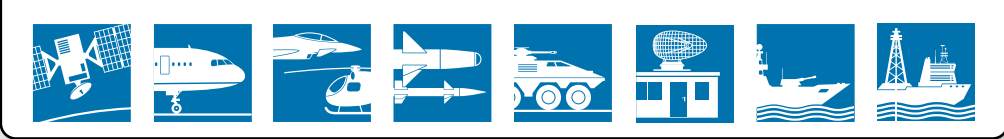
High-Reliability XMC Mezzanine Connector

Engineered for high-speed reliability across the most adverse environments—the Mezalk connector enables 5+ GHz data rates coupled with a four-point redundant contact system based on the VITA 61 standard.

- 60 and 114 positions
- 10, 12, 15, and 18 mm stack heights
- Mini-Box contact system provides four points of contact for ultra-reliability
- 500 mating cycle durability
- Improved thermal cycling stability compared to VITA 42 connectors—2000 or more thermal shock cycles
- Anti-stubbing design during mating
- LCP plastic housings offer superior thermal stability and low outgassing
- Compliant BGA board-attach supports standard surface mount processing and excellent thermal stability
- 114-position footprint compatible to XMC footprint and all dimensional constraints



	50 Microinch Gold Mating Face		30 Microinch Gold Mating Face	
	Tin-Lead BGA	Lead Free BGA	Tin-Lead BGA	Lead Free BGA
114 (6 x 19) Positions				
Pin Connector	2102060-1	2102060-2	2102060-3	2102060-4
Socket Connector	10 mm	2102061-1	2102061-5	2102061-6
	12 mm	2102061-3	2102061-7	2102061-8
	15 mm	1-2102061-3	1-2102061-5	1-2102061-5
	18 mm	2102061-9	1-2102061-0	1-2102061-2
60 (6 x 10) Positions				
Pin Connector	2102079-1	2102079-2	2102079-3	2102079-4
Socket Connector	10 mm	2102080-1	2102080-5	2102080-6
	12 mm	2102080-3	2102080-7	2102080-8



**VITA 62
MULTI-BEAM XLE Power Connectors**

The MULTI-BEAM XLE power connector, specified for the VPX VITA 62 power supply standard, is derived from a commercial design that offers 50 A and 20 A contacts. Even compared to earlier versions in the same connector family, the XLE delivers up to 40% more power in the same space. The design is hot pluggable, tolerates mating misalignment, and has lower mating forces.

- 20 A and 50 A power contacts, plus signal contacts
- 3-beam high-conductivity-copper contact design allows for a greater angular misalignment between mating connectors and offers a lower mating force
- Slim guide sockets reduce the overall PCB footprint
- Vented housing allows for better heat dissipation
- Hot-plug capable



Connector Configuration (No. of Contacts)			Part No.		
High Power (50 A)	Low Power (20 A)	Signal	Receptacle	Plug	
10	—	36	1-6450869-0	6450849-6	
2	6	32	1-6450869-4	6450849-7	
7	—	—	6450863-5	6450843-6	



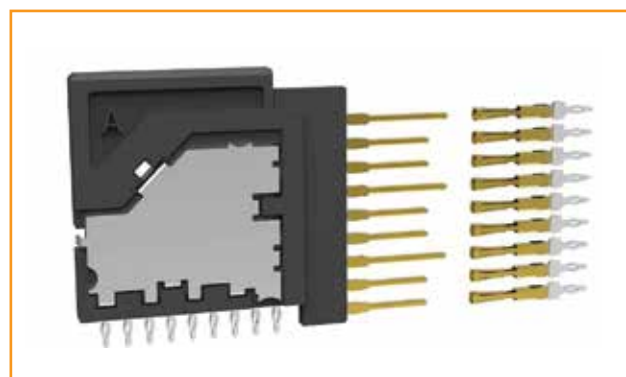
NEXT-GENERATION CONNECTIVITY

Fortis Zd Connectors

Extreme mechanical and electrical performance for the most demanding bandwidth applications.

With high speeds and high reliability in demanding applications, the Fortis Zd connector family is designed to meet next-generation processing-intensive applications. The connectors support speeds of 12+ Gb/s in a design that saves weight and space.

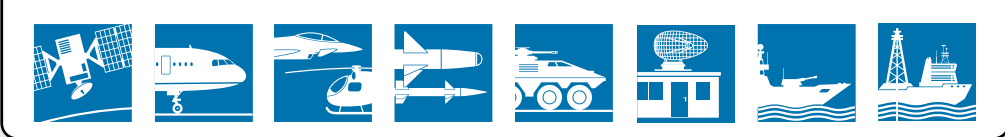
- Allows 12+ Gb/s data rates
- Extreme mechanical and electrical performance for the most demanding applications
- Modular design allows for user configurability and modular evolution
- M55302-heritage Mini-Box separable interface provides four points of contact on all sides of the pin
- Three shell varieties for application versatility, including:
 - Plastic for lowest weight
 - Shielded for EMI protection
 - Machined metal shell for ruggedized daughtercard
- 3-pair (9-row) and 2-pair (6-row) versions available to accommodate multiple slot pitches
- Space-compatible materials
- Proven compliant pin board attach facilitates manufacturing efficiency, repairability, and superior electrical performance
- Staggered daughtercard pin field supports two-level maintenance
- Protected pin field on backplane for reliability and durability



The Fortis Zd connector builds on proven technology—such as contact leadframe and Mini-Box contacts—to provide reliable, rugged high-speed performance.



The Mini-Box contact, with spring contact on all four of the mating posts, has years of proven reliability in rugged applications.



STANDARD MODULES

		Part No.					
		Left	Center		Right	Full Shroud	
		10 Col.	10 Col.	20 Col.	10 Col.	10 Col.	20 Col.
6-Row (2-Pair) Connector Modules							
Right-Angle	Differential	2102086-1	2102087-1	2102096-1	2102088-1	2102081-1	2102232-1
Vertical	—	2102092-1	2102093-1	2102098-1	2102092-1	2102094-1	2102234-1
9-Row (3-Pair) Connector Modules							
Right-Angle	Differential	2000890-1	2000891-1	2000903-1	2000892-1	2102155-1	2102159-1
	Single Ended	2102314-1	2102315-1	2102316-1	2102317-1	2102318-1	2102319-1
Vertical	—	2000895-1	2000896-1	2000905-1	2000895-1	2102157-1	2102161-1

-1 parts have tin-lead plated contact tails; for lead-free tin order -2.

SHIELDED MODULES

		Part No.					
		10 Col.	20 Col.	30 Col.	40 Col.	50 Col.	60 Col.
6-Row (2-Pair) Connector Modules							
Right-Angle	Differential	2102515-1	2102515-2	2102515-3	2102515-4	2102515-5	2102515-6
Vertical	—	2102516-1	2102516-2	2102516-3	2102516-4	2102516-5	2102516-6
9-Row (3-Pair) Connector Modules							
Right-Angle	Differential	2102247-1	2102247-2	2102247-3	2102247-4	2102247-5	2102247-6
	Single Ended	2102320-1	2102320-2	2102320-3	2102320-4	2102320-5	2102320-6
Vertical	—	2102248-1	2102248-2	2102248-3	2102248-4	2102248-5	2102248-6

MACHINED METAL SHELL FOR RIGHT-ANGLE MODULES

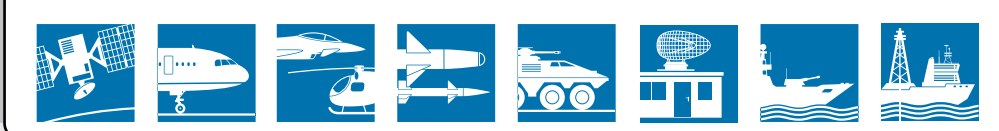
		Part No.					
		10 Col.	20 Col.	30 Col.	40 Col.	50 Col.	60 Col.
6-Row (2-Pair) Connector Modules							
Right-Angle	Differential	2102114-1	2102114-2	2102114-3	2102114-4	2102114-5	2102114-6
9-Row (3-Pair) Connector Modules							
Right-Angle	Differential	2102077-1	2102077-2	2102077-3	2102077-4	2102077-5	2102077-6

Shells are applied to right-angle modules, ordered separately. They mate with standard vertical modules.

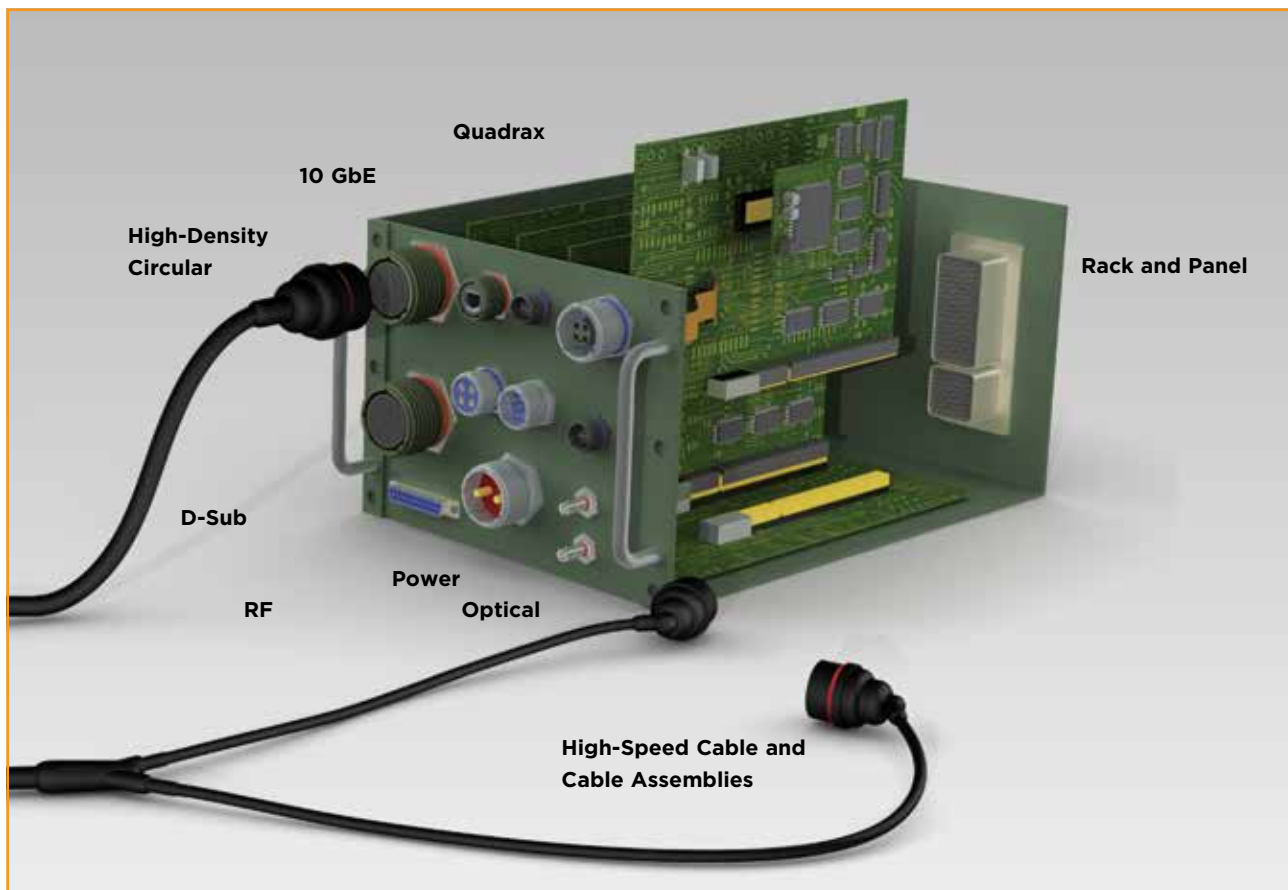
GUIDE HARDWARE

		Part No.		
		Universal Guide Hardware	VITA 46	Rugged VITA 46 Machined
Guide Pin	223969-X	1-1469491-X	2000676-X	
Guide Module	223979-X	1-1469492-X	2000713-X (with ESD contact)	

See TE drawings for guide module and pin options.



COMPLETE SOLUTIONS FOR EMBEDDED COMPUTING



Count on TE for complete end-to-end solutions to enable high-performance computing. Our I/O solutions give you one of the widest ranges of choices for helping to increase speeds speeds, going longer distances, and eliminating bandwidth bottlenecks.



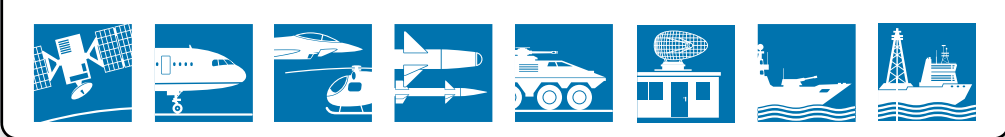
CeeLok FAS-T Connectors

- Small, field terminable, 10 Gigabit Ethernet, rugged I/O connector
- Compact size 8 shell saves weight and space
- Ruggedized for excellent shock, vibration, temperature, and sealing performance, with integral backshell that provides low cost, low-weight strain relief, and EMI protection



DEUTSCH D-MAX Gigabit Connectors

- One of the highest speed I/O connectors available
- Single-channel size 11 or four-channel size 25 38999 shells or ARINC 809
- Fast, easy assembly
- Composite or metal shell
- Lanyard-release option



DEUTSCH Wildcat Connectors

- Full range of sizes and configurations, with wide choice of materials and finishes
- 38999 and micro sizes
- Close to double density compared to standard 38999



Rack and Panel Connectors

- I/O for LRUs and LRMs
- Blindmate, rugged, high pin count
- Signal, Quadrx, RF, power, and optical (ARINC 801 and mini expanded beam)



RF Connectors

- Wide range of standard, subminiature, and microminiature interfaces and frequencies
- Connectors, cables, and cable assemblies
- Qualified to MIL-PRF-39012, MIL-DTL-83517, MIL-PRF-55339



High-Speed Cable

- Gigabit/10G Ethernet
- Fibre Channel
- DVI/HDMI
- IEEE 1394
- USB 3.0
- CANbus



Optical Connectors

- Expanded beam, ceramic ferrule, and MT termini
- Single mode and multimode for any reach
- Compatibility with an extensive line of standard and optics-only connectors



Harnessing Components

- Families matched to application extremes
- Heat-shrink tubing
- Molded parts
- Adhesives
- Backshells
- Identification
- Solder sleeves and termination devices

1.800.CALL.TTI

TTI, Inc.
2441 Northeast Parkway
Fort Worth, TX 76106-1816

The Specialist in Electronic Component Distribution
A Berkshire Hathaway Company

www.ttiinc.com



www.te.com/ADM

© 2013 Tyco Electronics Corporation. All Rights Reserved.

CeeLok FAS-T, DEUTSCH, Fortis Zd, Mezalok, MULTI-BEAM XL, MULTIGIG RT, TE Connectivity and the TE connectivity (logo) are trademarks of the TE Connectivity Ltd. family of companies.

VPX (logo) is a trademark of VITA. Other products, logos, and company names mentioned herein may be trademarks of their respective owners.

While TE has made every reasonable effort to ensure the accuracy of the information herein, nothing herein constitutes any guarantee that such information is error-free, or any other representation, warranty or guarantee that the information is accurate, correct, reliable or current. The TE entity issuing this publication reserves the right to make any adjustments to the information contained herein at any time without notice. All implied warranties regarding the information contained herein, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose are expressly disclaimed. The dimensions herein are for reference purposes only and are subject to change without notice. Specifications are subject to change without notice.

Consult TE for the latest dimensions and design specifications.