# Quick Reference Guide
## 2-Piece Power Connectors

### THINGS TO CONSIDER WHEN CHOOSING POWER CONNECTORS

**Application.** Does the application require a board-to-board, wire-to-board, wire-to-wire, bus bar, card edge or a combination of these types of connectors?

**Current and Voltage.** Does the connector require power only, or a combination of power and signal? How much current is required in the application? Keep in mind that power connector performance is typically measured in amperes (or amps). The voltage is also very important as it defines the spacing between the contacts.

**Hot-Pluggability.** Will the application be mated while under electrical load? If so, a hot-pluggable connector is required. Many of the products in this guide have been approved for use in hot-plug applications.

### TYPICAL POWER CONNECTOR APPLICATIONS

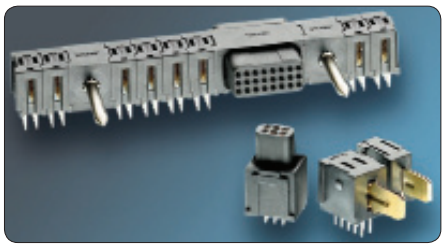
- AC to DC and DC to DC
- Power Supplies
- High End Computers
- Servers
- Data Storage Equipment
- Telecommunications Switches
- High Density Power Distribution
- Uninterruptible Power Supplies (UPS)
- Removable Battery Packs
- Board Stacking
- Power Distribution

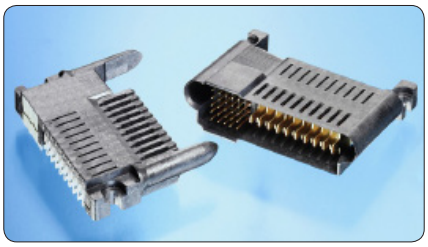
## Application: Hot Swappable Power Supplies (500w–5KW)

| CHARACTERISTICS | | | |
|---|---|---|---|
| **Connector** | **MULTI-BEAM XLE** | **FLATPAQ** | **MINIPAK HDL** |
| **Current Rating** | Up to 75 A* | 32 Amps* | Up to 40 Amps* |
| **Vented Housings** | I | | I |
| **Licensed — Second source** | I | | I |
| **Height (mm)** | 12 mm | 14 mm | 8 mm - 9 mm |
| **Modular** | | I | |
| **Active Guides** | | I | |
| **Customizable** | I | I | I |

* Single contact current rating

te.com/products/multibeamxle





te.com/products/minipakhdl

### MULTI-BEAM XLE Connector

- New 6 beam power contact offers up to 75 A current rating and delivers more than 200 Amps/linear inch
- New 25A low power contact occupies 50% less pcb space than MULTI-BEAM XL power contacts
- New slim guide sockets reduce the overall PCB footprint
- Vented housing allows for better heat dissipation
- Hot-plug capable

**Reference Part Numbers***

6450830-2
6450850-2

### FLATPAQ Connectors

- 32 Amp high-performance CROWN BAND power contacts
- True hot-plug power contacts available
- Versatile modular design allows low volume customized configurations to meet your specific application requirements
- Solder and compliant press-fit termination options available
- Rugged design features active guide pins

**Reference Part Numbers***

6646597-1
6646722-1

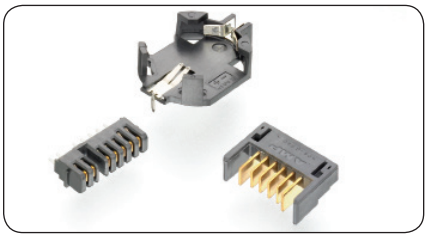
### MINIPAK HDL Connector

- High-density, low profile, power/signal, blind-mate connector
- Developed to meet next generation 1U application by reducing airflow impedance
- Hot-pluggable power supplies
- Contacts rated up to 40 amps and deliver more than 150 amps per linear inch

**Reference Part Numbers***

2-1926732-5
2-1926733-5
1926845-6

## Rechargeable Batteries (for portable/hand-held electronic devices)



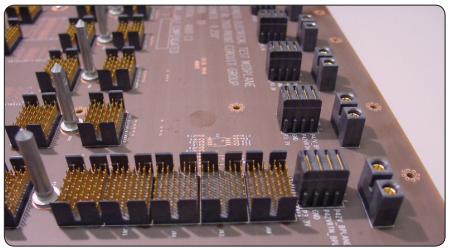
### Battery Interconnects

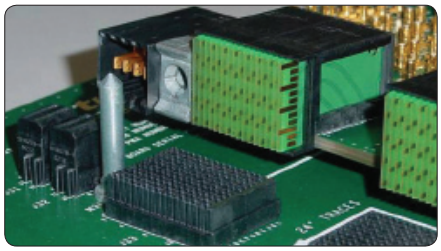
- Current capacity — 7 Amps/single contact at 30° T-Rise
- Choice of right angle or vertical mount headers with left, right or keyless polarization
- 5 mm pitch headers available for 7.2, 10.8 and 12.0 volts rechargeable batteries

| RECHARGEABLE BATTERIES | | | | |
|---|---|---|---|---|
| **Part Number** | **Pitch (mm)** | **No. of Positions** | **Mount** | **Style** |
| **1827684-1** | 2 | 7 | Vertical Surface Mount | Receptacle |
| **1827654-1** | 2 | 7 | Right Angle Thru-Hole | Plug |
| **1-1123688-7** | 2.5 | 10 | Vertical Surface Mount | Receptacle |
| **6123978-1** | 2.5 | 4 | Right Angle Thru-Hole | Plug |
| **120591-1** | / | 1 | Horizontal Thru-Hole | Coin Cell |
| **5787430-1** | 5 | / | Vertical Solder | Right Hand Plug |
| **5787441-1** | 5 | / | Right Angle Solder | Keyless Plug |

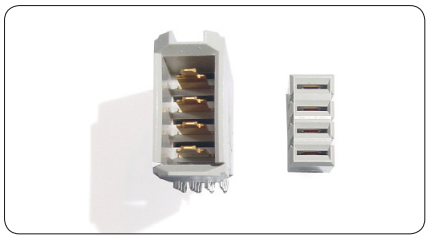
*Part numbers listed are examples of some available samples, please visit website for additional and mating part numbers.

## Application: Backplanes





| PRODUCTS | | | | | |
|---|---|---|---|---|---|
| Amps/Linear Inch | Universal Power Module | MULTIGIG RT | ICCON | MINIPAK HDE | Stacked ICCON |
| < 125 | I | | | | |
| 125 – 175 | | I | I | | |
| 175 – 225 | | | | | I |
| > 225 | | | | I | |

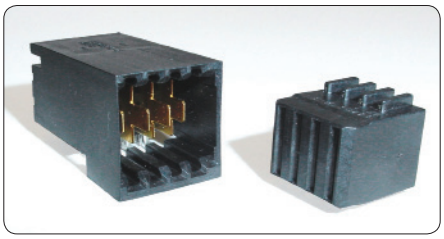


te.com/products/upm

### Universal Power Module (UPM) Connectors (Slim UPM shown)

- Varieties of UPM include: standard, high current, slim, low profile
- 2 performance levels
  - Standard 10 amp contact
  - High current 16 Amp contacts
- True hot-plug contacts
- High reliability — up to 250 cycles
- Different configurations include right angle, vertical, coplanar and mezzanine

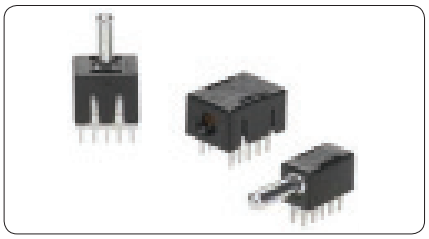
**Reference Part Numbers***
1903977-1 (Slim UPM), 1645498-2 (Vertical Plug), 5646954-2 (R/A Plug)



### MULTIGIG RT Connectors

- 2 mm backplane connectors
- 20 Amp contacts
- Three contact mating lengths are available in 1.5 mm sequence levels
- 1 and 2 row versions to provide maximum trace routing flexibility
- True hot-plug contacts

**Reference Part Numbers***
1-1410271-1 (Plug)
1410270-2 (Receptacle)

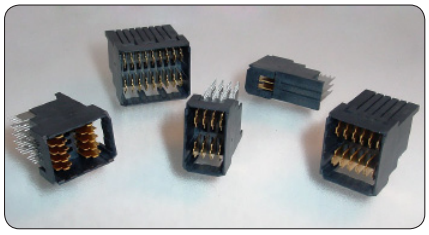


te.com/products/iccon

### ICCON Connectors

- With and without locking feature
- 35A current rating
- Slimline version available, 30% smaller footprint
- Board-to-board, board–to-busbar, and wire-to-board application options
- Durable, quick connect/disconnect function for high current space constrained applications

**Reference Part Numbers***
6643274-1 (Vertical Pin),
6643228-1 (R/A Pin),
6643220-1 (SLIMLINE Socket)



te.com/products/minipakhde

### MINIPAK HDE Connectors

- Designed to compliment other backplane connectors offered by TE including Z-PACK HM-Zd, Z-PACK TinMan and other connectors
- Very high current density — 18 Amps per contact, over 250 Amps/linear inch
- Two levels of contact sequencing for mate-first-break-last operation

**Reference Part Numbers***
1926226-1 (2x6), 1926229-1 (2x9)

te.com/products/iccon

### Stacked ICCON Connector

- Very High Current Density — Up to 200 Amps per inch
- Occupies less PCB edge space than separate ICCON power and guide modules
- Designed to compliment Z-PACK and other backplane connectors
- Right angle connector to mate motherboard-to-daughterboard power distribution systems
- Ground pin, power pin and mate-first-break-last pin options

**Reference Part Numbers***
2085181-1 (R/A Socket)
1766663-1 (Vertical Pin)

*Part numbers listed are examples of some available samples, please visit website for additional and mating part numbers.

## Application: Cable Power

| CABLE POWER | | | |
|---|---|---|---|
| **Products** | **Wire Size** | **Current Rating** | **Specialty** |
| **MULTI-BEAM XLE** | 26-8 AWG | up to 50 Amps | Low, high power options in same connector |
| **ET POWER** | 14-10 AWG | up to 35 Amps | Low profile |
| **RAPID LOCK** | 12-0 AWG | 50-250 Amps | BusBar Quick Connect/ Disconnect |
| **High Current Universal MATE-N-LOK** | 30-10 AWG | up to 35 Amps | Panel mount or free hanging versions |
| **AMP Power Series** | 300MCM-0 AWG | 15-275 Amps | Single & 2 pole Quick Connect/Disconnect |
| **Wave Crimp** | Flat Cable | 40-110 Amps | Flat |

te.com/products/multibeamxle

### MULTI-BEAM XLE Cable Receptacles

- X, Y, Z float mount, blind-mate connectors for drawer type applications
- Allows more angular misalignment than the original MULTI-BEAM XL connector
- Modular design to meet any application
- Hot-Pluggable
- Panel Mount, Slide-to-Lock and Squeeze-to-Release configurations are available

te.com/products/wavecrimp

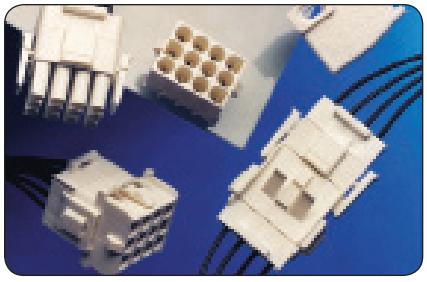
### AMPOWER Wave Crimp System

- Flat cable, dissipates heat better than round wire
- Termination of flat cable requires no stripping. Provides a reliable low resistance, gas tight interface
- Lower operating temperature than standard round/discrete wires
- Easily formed into shape, without cable ties
- Lower cost than laminated bus bars

te.com/products/amppowerseries

### AMP Power Series Connectors

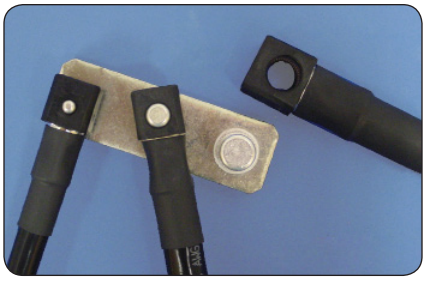
- Single pole and 2-pole connector housings, crimp snap-in contacts, and accessories
- Rugged contact design
- Open barrel contacts 6-20AWG on reels for automatic and semiautomatic machine termination
- Compatible with industry alternate standard versions



te.com/products/universalmatenlok

### High Current Universal MATE-N-LOK II Connectors

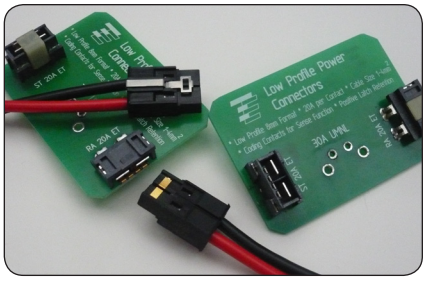
- Available in 2-15 circuit sizes for free hanging, panel mount, or wire-to-board connection
- Louvertac band and screw machined contacts provide very high current with low contact resistance
- No extraction tools required/economical
- Pin and sockets can be intermixed in the same housing



te.com/products/rapidlock

### RAPID LOCK Bus Bar Connectors

- Locking feature retains each contact to mating pin
- No installation tools required
- Fast, reliable replacement for power lugs
- Up to 250 Amps per contact; very low contact resistance




te.com/products/etpower

### ET Power Connector

- Up to 35Amps per contact
- End-to-end stackability
- Low profile, less than 8 mm above PCB
- Cable-to-PCB applications
- Positive latch retention
- Right angle and vertical mounts

## Industry Standards

| PRODUCTS | | | | |
|---|---|---|---|---|
| **Standards** | **Z1 Power Connector** | **MINIPAK HD** | **Guide Hardware** | **MULTI-BEAM XLE** |
| **Advanced TCA** | 1766500-1 | | 1-1469373-1 | |
| **PICMG MicroTCA.0** | | 1469920-1 | | |
| **VITA 41** | | | 1410465-1 | |
| **VITA 46** | | | 1410956-1 | |
| **VITA 62** | | | | 6450843-6 |

**Note:** Part numbers listed in the above table are some available samples for each standard. There are other part numbers and configurations to choose from.

### AdvancedTCA
The PICMG 3.0 AdvancedTCA standard defines architecture for modular computing components within communications network infrastructure. The standardization focuses on providing superior power and cooling capabilities in solutions that are cost effective, highly available and highly scalable.

### MicroTCA
The PICMG MicroTCA.0 standard is complimentary to the AdvancedTCA standard, but is optimized for smaller scale and more price sensitive applications.

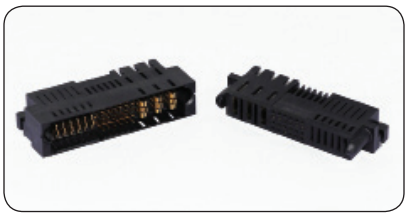
### VITA 41
Referred to as VXS-VME Switched Serial in the next generation of VME backplanes and introduces features like improved bandwidth, backward compatibility and increased power delivery into the existing VMEbus technology.

### VITA 46
Based on VMEbus technology, the standard is defined for 3U and 6U formats and merges the latest in connector and packaging technology with the latest in bus and serial fabric technology.

### VITA 62
The latest in VITA Standards, VITA 62 is currently being defined and will use the standard VPX 3V16U form factor and comply to requirements defined in VITA. 48.0. VITA 62 will define the power generation requirements for a module that can be used to power systems that support a VITA 62 slot on the VPX backplane.

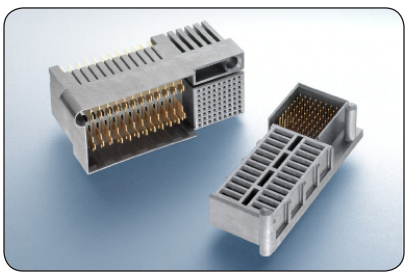
te.com/products/guidehardware

### Guide Hardware
- Guide modules are available for the AdvancedTCA, VITA 41.0 VXS and the VITA 46.0 VPX standards
- Most guide modules are keyed to prevent misalignment during board-to-board mating
- ATCA guide modules are available for a variety of applications including front board, mid plane, backplane and rear transition modules as specified in the AdvancedTCA specification
- MULTIGIG RT guide modules meet the VITA 46.0 VPX and VITA 41 VXS standards

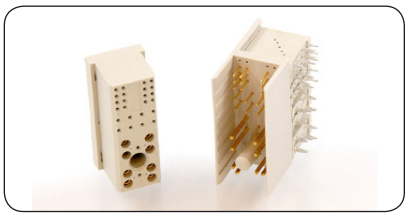


te.com/products/multibeamxle

### MULTI-BEAM XLE Connector
- VITA 62 standard developed around MULTI-BEAM XLE connector
- New 6 beam power contacts offer a 50A current rating and lower mating force
- New 20A low power contact occupies 50% less PCB space than MULTI-BEAM XL power contacts
- Vented housing allows for better heat dissipation



te.com/products/minipakhd



te.com/products/atcapower

### Z1 Power Connector
- Designed to PICMG 3.0 AdvancedTCA standard
- Combines 8 high conductivity size 16 pin & socket contacts with 22 size 22 pin & socket contacts
- Capable of carrying 20 Amps per contact and the signals are capable of carrying 2 Amps per contact

### MINIPAK HD Connectors
- Designed to the MicroTCA.0 standard
- 30 microinches gold plating over nickel
- Hot-plug contact design controls arc during hot-mate/un-mate cycles
- Available to carry up to 14.5 Amps per contact fully loaded

For more information on TE Industry Standard Products visit:
**te.com/products/atca**

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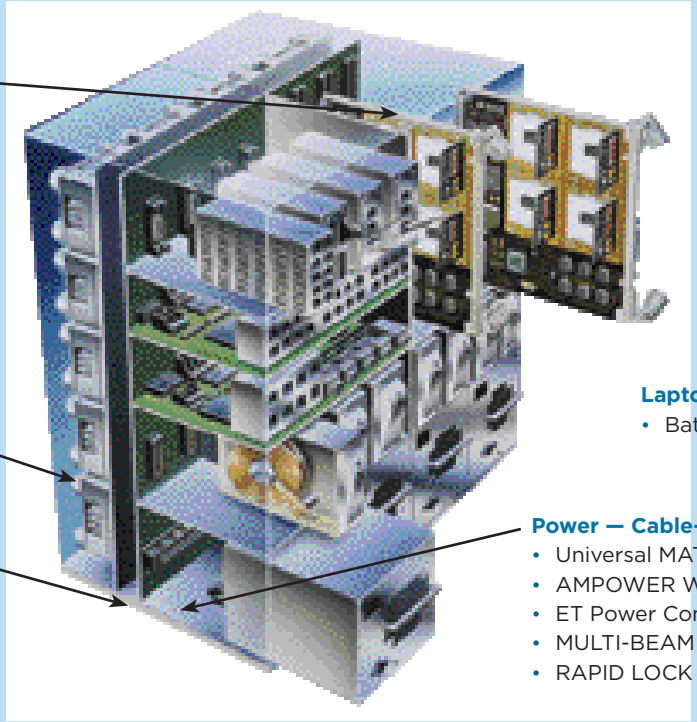
## Application Diagram

**Integrated Backplane Power Systems**
- Universal Power Modules (UPM)
- MINIPAK HDE Connectors
- MULTIGIG RT Power Modules
- Guide Hardware
- Z1 Power (AdvancedTCA) Connectors

**Bus Bar-to-Board**
- ICCON Connectors
- RAPID LOCK Connectors

**Power — Board-to-Board**
- MULTI-BEAM XLE Connectors
- FLATPAQ Modular Connectors
- MINIPAK HDL Connectors
- MINIPAK HD (MicroTCA) Connectors



**Laptops/Portables**
- Battery Interconnects

**Power — Cable-to-Cable/Board**
- Universal MATE-N-LOK Product
- AMPOWER Wave Crimp System
- ET Power Connector
- MULTI-BEAM XLE Cable Receptacles
- RAPID LOCK Connectors

**FOR MORE INFORMATION**

**TE Technical Support Center**

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| China: | +86 (0) 400-820-6015 |

Part numbers in this brochure are RoHS Compliant*, unless marked otherwise.
*as defined www.te.com/leadfree

Most products in this brochure have been qualified by UL and/or CSA.

**te.com**

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**Sample Kits!**

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