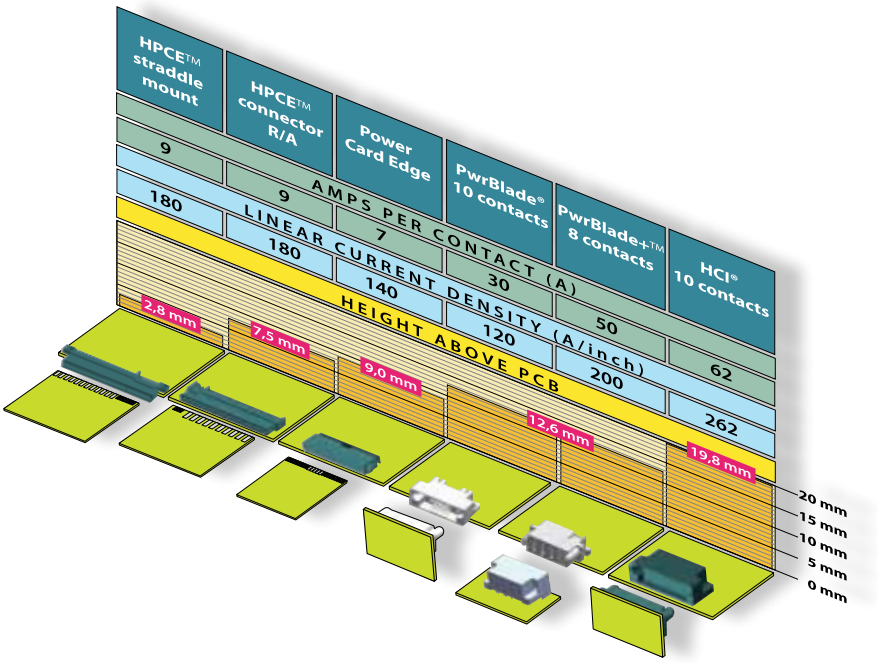
FCI

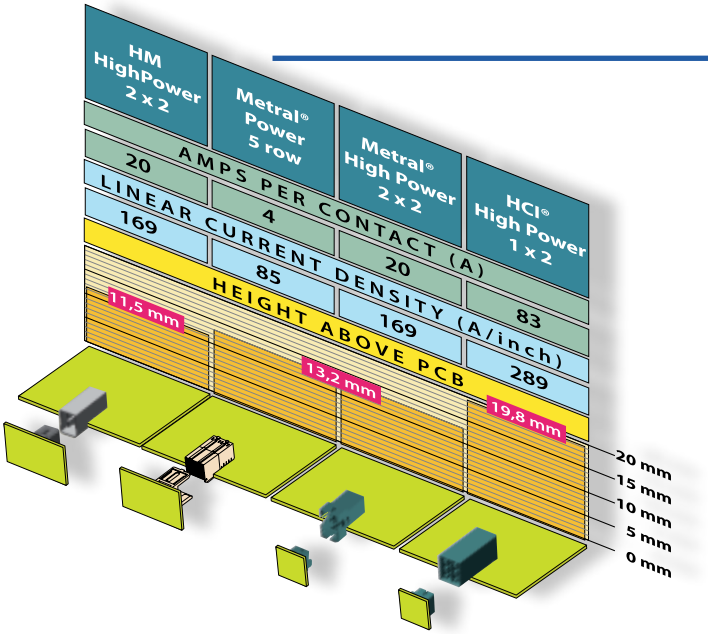
ELECTRONICS

Power Solutions℠

FCI: SETTING THE STANDARD FOR CONNECTORS

With 14,000 employees in 30 countries and sales of 1,28 Billion euros in 2010, FCI is a leading manufacturer of connectors for various markets such as automotive, telecommunication infrastructures and consumer and industrial electronics.



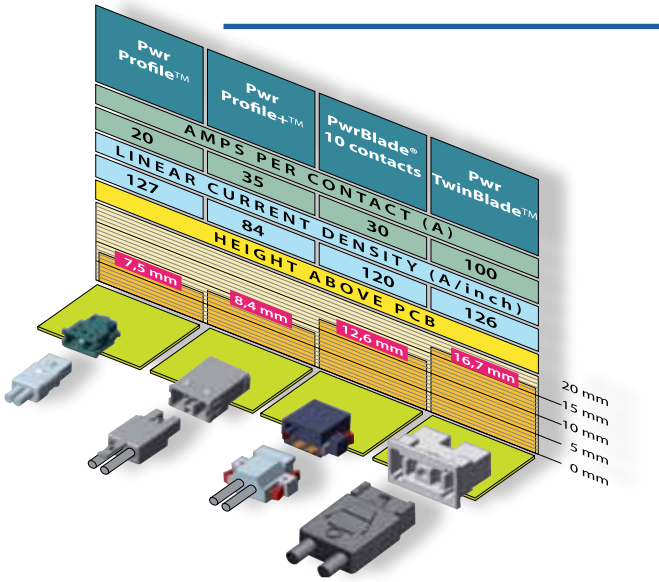


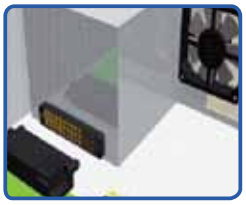
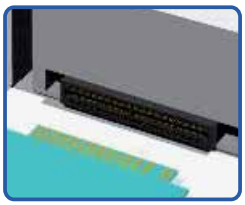
Power SolutionsSM

FCI offers a broad range of power connector solutions for power supply and host-to-card interfaces as well as cable assemblies for power distribution.

FCI understands the evolving market requirements for power connectors and continues to provide innovative and cost-effective power product solutions to address the challenges of reducing power loss, increasing power density and facilitating airflow for thermal management.

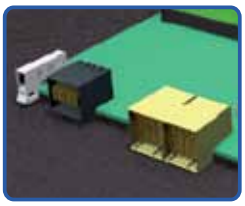
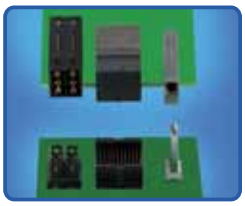
FCI can provide the design engineer with end-to-end power solutions for chassis-based equipment designs. FCI is ready with the right power solution for you.



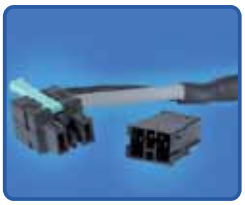

Power Supply Solutions

- Power Card Edge ____ 4-5
- High Power Card Edge ____ 6-7
- PwrBlade® ____ 8-11
- HCI® ____ 12-13

Host-To-Card

- Hard Metric (HM) High Power ____ 14-15
- HCI® High Power ____ 16-17
- Metral® Power ____ 18-19
- Metral® High Power ____ 20-21




Power Cables & Power Distribution

- PwrProfile+™ ____ 22-23
- PwrBlade® Cables ____ 24-25
- Pwr TwinBlade® ____ 26-27
- Power Distribution (Bus Bars) ____ 28-29
- Power D-Sub; µTCA™ ____ 30-31
- USB + Power ____ 32-33
- Sofix® Power Connectors ____ 34-35

POWER CARD EDGE

LOW PROFILE AC/DC POWER DISTRIBUTION CONNECTOR SYSTEM

DESCRIPTION

The Power Card Edge connector is a cost-effective connector system that can be used for DC power output from embedded AC/DC power supplies or for power distribution between boards within an enclosure. The connector range includes options for right-angle, vertical, or straddle-mount solder termination. The connectors' low profiles are ideal for use in enterprise data or communications equipment, particularly in servers and external storage systems.

The width of the Power Card-Edge connector body is 9mm or less, making it well-suited for use in 1U rack-mount servers or on power distribution boards inside 1U redundant power supply assemblies. The low connector profile helps maximize airflow through a power supply for increased cooling.

Adjacent power contacts are positioned on 2.54mm pitch along the card edge. Power contacts are manufactured using a high-conductivity copper alloy. Each power contact is rated for up to 7A current measured at 30°C temperature rise in still air. Signal contacts are positioned on 1.27mm pitch.

Right-angle, vertical and straddle-mount connectors are available in various circuit counts with a full complement of power contacts. Right-angle connector options also include versions that combine power and power control signal contacts or power contacts and an integrated AC pass-through port in a single connector.

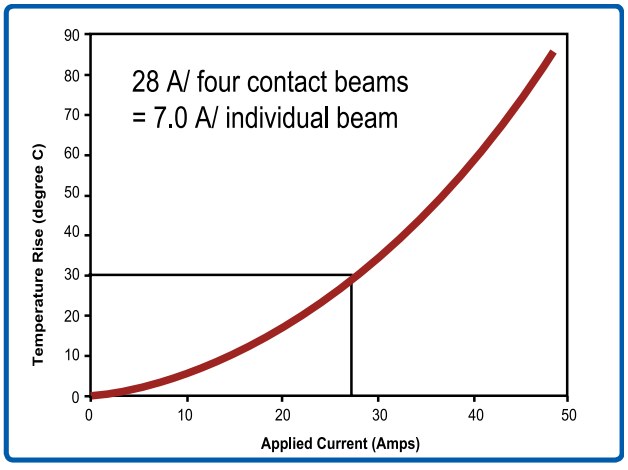
TARGET MARKETS / APPLICATIONS

- AC/DC pluggable power supplies in data, telecom & datacom/networking
- Industrial PCs
- Industrial controls & instrumentation
- Medical

FEATURES & BENEFITS

- 7A/contact for multiple contacts at 30°C temperature rise in still air
- One-piece card edge design enables cost-effective power delivery for 1U and 2U power supplies or power distribution applications
- Low-profile design maximizes airflow for system cooling
- Right angle option is available with both power contacts for power distribution and signal contacts for power control
- Integrated power and signal design simplifies board assembly
- Right angle product range includes version with molded posts or metal fork locks for board retention
- Straddle-mount connectors feature mounting ears for secure PCB attachment
- Optional AC cable port is available for a cable pass-through solution
- Lead free plating is available for RoHS compliance

TEMPERATURE RISE CURVE



Current rating information is in still air (no air flow) with multiple contacts energized unless otherwise noted

TECHNICAL INFORMATION

MATERIALS

- Housing: high-temperature thermoplastic (UL94V-0), black
- Contact base material:
  - Power – high-conductivity copper alloy
  - Signal – copper alloy
- Contact finish:
  - Separable interface: 30µin (0.76µm) performance-based plating over nickel
  - Board termination area: Matte tin over nickel

ELECTRICAL PERFORMANCE

- Current rating: 7A/power contact measured at 30°C temperature rise in still air
- Insulation resistance: 5000 MΩ minimum for power contact
- Withstanding voltage: 1000V AC for power contact
- Contact resistance:
  - Right-angle: 55 mΩ maximum
  - Straddle-mount: 20 mΩ maximum
  - Vertical: 20 mΩ maximum

MECHANICAL PERFORMANCE

- Durability: 200 mating/un-mating cycles
- Insertion force for an add-in board:
  - Right-angle: 13.62 kg maximum
  - Vertical or straddle-mount: 8.0 kg maximum
- Operating temperature range: -5°C to +105°C

SPECIFICATIONS

- Right-Angle Product Specification: GS-12-259
- Vertical Product Specification: GS-12-338
- Straddle-Mount Product Specification: GS-12-279

APPROVALS AND CERTIFICATIONS

- UL ,CSA and TUV approved

PACKAGING

- Trays

PART NUMBERS

MAIN PRODUCTS	PART REFERENCES
Right Angle Solutions	
10P + 24S + 10P	10028886
14P + 24S + 14P	
20P + 24S + 20P	
28P + 24S + 28P	
With AC power port	10055090
2x14, 2x17, 2x22, 2x25, 2x28, 2x29, 2x31, 2x32 power	10035388
2x32 power w/ housing stand-offs	10053363
Vertical Solutions	
2x19, 2x31, 2x32, 2x35 power	10046971
2x8 power w/ mounting ears	10046972
2x19, 2x31 power w/ press-fit tails	10075664
Straddle-Mount Solutions	
2x19, 2x23 power	10034908

Use the base numbers to reference the product drawings to obtain detailed dimensions and complete part numbers.

High Power Card Edge (HPCE™)
Next Generation Power Card Edge Connector

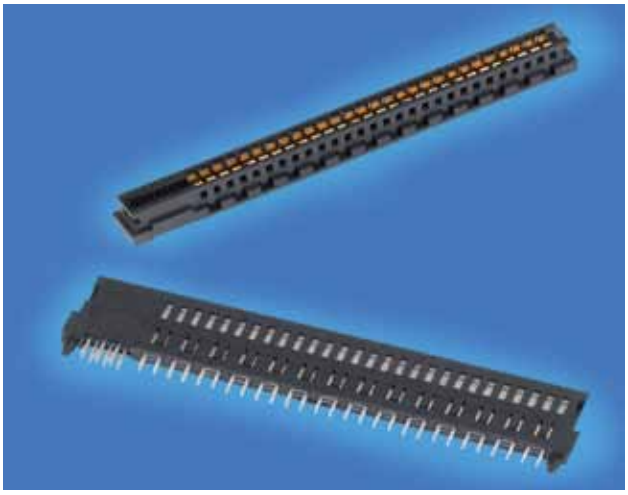
DESCRIPTION

High Power Card Edge (HPCE™) is a next generation power card edge connector for demanding applications requiring high linear current density and low power loss. HPCE offers a low profile height (≤ 7.50mm) and is based on very cost effective and highly reliable stamped-and-formed power contact technology similar to other power solutions from FCI.

HPCE incorporates an innovative power contact and housing design that permits a more compact and lower profile package for demanding AC and DC power supply and/or add-in card applications. HPCE's low profile height (for maximized airflow), significantly increased linear current density and low contact resistance characteristics are ideal for next generation 1U/2U servers, storage enclosures, telecommunications equipment and datacom/networking equipment.

HPCE is available with power and signal contacts integrated into a single molded housing for power distribution and power control. Similar to other FCI power solutions, HPCE is modularly tooled making the product highly configurable in terms of the number and placement of the power and signal contacts for custom power needs.

HPCE is rated to 9A per power contact beam (with multiple power contacts fully energized) without exceeding a 30°C temperature rise in still air. The innovative design minimizes the connector footprint and the robust housing includes touch-proof safety features as well as polarization to ensure proper mating. Vertical and right angle options are available to accommodate various system architectures.



FEATURES & BENEFITS

- Current rating to 9A/power contact beam (with multiple power contacts fully energized) without exceeding a 30°C temperature rise in still air
- Low ≤ 7.50mm profile height maximizes airflow for effective systemcooling
- One-piece assembly enables cost-effective power delivery for 1U and 2U power supplies or power distribution applications
- Highly vented housing design maximizes heat dissipation
- Vertical and right angle options are available with both power contacts for power distribution and signal contacts for power control
- Number and placement of power and signal contacts are highly configurable for custom power needs
- Polarized housing option ensures proper mating board orientation
- Plastic press pegs are available for polarization to the host PCB as well as to secure the connector during the wave solder process
- Robust design includes touch-proof safety features that are UL/IEC 60950 compliant
- Solder or press-fit tails are available on the vertical option for termination flexibility
- Compatible with lead-free processing temperatures

TARGET MARKETS / APPLICATIONS

- AC/DC pluggable power supplies in data, telecom & datacom/networking equipment
- Industrial PCs
- Industrial controls & instrumentation
- Medical

TECHNICAL DATA

PHYSICAL

- Housing: High-temperature thermoplastic, black
- Flammability rating: UL 94 V-0
- Contact material: High-conductivity copper alloy
- Contact finish:
  - Separable interface: 30µin (0.76µm) performance-based plating over nickel (per the GS-12-604 product specification)
  - Board connector solder tail area: Matte tin over nickel

ELECTRICAL PERFORMANCE

- Current rating: 9A/power contact beam at 30°C T-rise in still air (multiple power contacts fully energized)
- Operating voltage
  - Power contacts: 250V maximum (fully loaded)
  - Signal contacts: 30V maximum (fully loaded)
- Dielectric withstanding voltage
  - Power contacts: 1,000V
  - Power contacts: 500V
- Insulation resistance
  - Power contacts: > 5,000 MΩ initially as well as after environmental exposure
  - Signal contacts: > 500 MΩ initially as well as after environmental exposure
- Contact resistance
  - Power contacts: ≤ 0.6 mΩ initially as well as after environmental exposure
  - Signal contacts: ≤ 20 mΩ initially as well as after environmental exposure

MECHANICAL PERFORMANCE

- Contact wipe distance
  - Power contacts: 5.27mm
  - Signal contacts: 4.00mm
- Durability: 200 mating cycles

ENVIRONMENTAL

- Operating temperature: -55°C to + 105°C
- RoHS information, this product is compatible according to the European Union Directive 2002/95IEC

REFERENCE DATA

- Product Specification: GS-12-604
- Application Specification: GS-20-128

CERTIFICATIONS & APPROVALS

- UL
- CSA
- TUV

PACKAGING

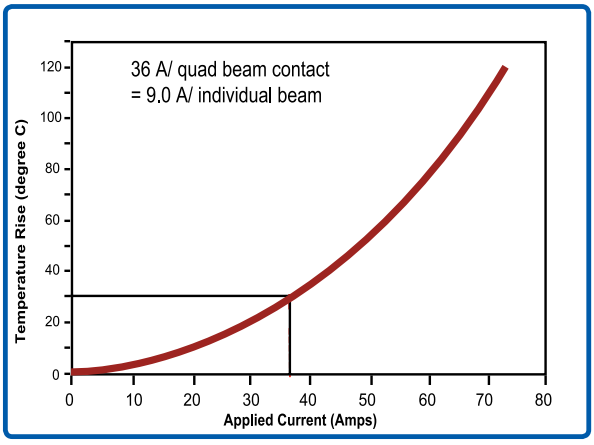
- Trays

PART NUMBERS

VERTICAL SOLUTION	Orientation Key	Part number
56 P + 12 S	No	10088418-002LF

RIGHT ANGLE SOLUTION	Hold down	Orientation Key	Part number
56 P + 12 S	No	No	10096926-002LF
56 P + 12 S	Yes	No	10096926-004LF

TEMPERATURE RISE CURVE



Current rating information is in still air (no air flow) with multiple contacts energized unless otherwise noted

PWRBLADE® CONNECTOR SYSTEM

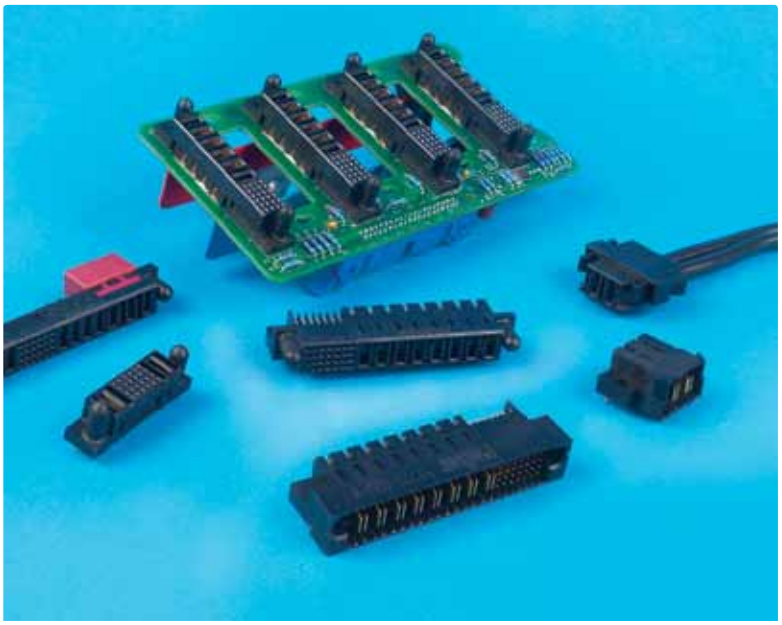
DESCRIPTION

The PwrBlade® power distribution connector system from FCI includes power and signal contacts to provide power distribution and power control in a single connector. Options for either vertical or right-angle versions of both headers and corresponding receptacles deliver support for coplanar, backplane or mezzanine connections. The connectors are ideal for robust power connections to embedded AC/DC power supplies or for board-to-board connections in servers, storage enclosures and communications equipment.

Initially developed to enable the implementation of Server System Infrastructure (SSI) Standards for Distributed Power Supplies (DPS), Mid-range Power Supplies (MPS) and High-end Power Supplies (HPS), PwrBlade® connectors are also available in wide variety of other configurations with either solder or press-fit board termination. The connectors can also be customized to address unique application requirements.

PwrBlade® connectors can be provided with one to 20 power contacts and zero to 148 signal contacts. Individual power contacts are rated at 48A current-carrying capacity; connector configurations with multiple power contacts are rated at 30A per power contact as tested for 30°C temperature rise in still air. An available cable port option provides segregated AC contacts for cable pass-through applications.

Capability for two levels of sequential mating for power contacts and two levels for signal contacts can support up to three levels of sequencing of power and signals. Sequential mating of ground, followed by power and signals can be used to provide “hot swap” capability. Molded guide posts on the header engage with the corresponding receptacle connector to assure alignment during blind-mating.



APPLICATIONS

- AC/DC pluggable power supplies in data, telecom & datacom/networking
- Server System Infrastructure (SSI)-compliant server systems
- Industrial PCs
- Industrial controls & instrumentation
- Medical

FEATURES & BENEFITS

- 48A/individual power contact; 30A/contact for 10 adjacent contacts at 30°C temperature rise in still air
- 60A/contact using UL test guidelines
- SSI-compliant connector interface for pluggable power supplies & power distribution applications
- Provides power contacts for power distribution and signal contacts for power control
- Number and placement of power and signal contacts are highly configurable for custom power needs
- Power contact spacing options exist for AC (300V max), DC (200V max) or high-density power (at same voltage)
- Meets applicable UL current interruption criteria for hot plug applications
- Rugged, molded-in guides enable blind mating
- Up to 3 levels of sequential contact including a short detect pin for hot swap applications
- Existing tooling capabilities accommodate up to 20 power contacts and 148 signal contacts in a single molded housing
- Solder or press-fit tail options are available for termination flexibility
- Board retention devices are provided to secure connectors during wave solder process
- AC cable port option (cable passthrough) as well as direct attach to busbars for power distribution are available
- Lead free plating is available for RoHS compliance

TECHNICAL INFORMATION

MATERIALS

- Housing: high-temperature thermoplastic (UL94V-0), black
- Contact base material:
  - Power – high-conductivity copper alloy
  - Signal – copper alloy
- Contact finish:
  - Separable interface: 30µin (0.76µm) performance-based plating over nickel
  - Board termination area: Matte tin over nickel

ELECTRICAL PERFORMANCE

- Insulation Resistance
  - Power contact: 10,000M ohms
  - Signal contact: 500M ohms
- Withstanding Voltage
  - Power contact: 2500 volts DC
  - Signal contact: 1000 volts DC
- Current rating: 48 Amps for single powered contact; de-rated to 30 Amps for 10 powered contacts at 30°C temperature rise with zero airflow
- Current rating: 60 Amps per contact per UL test guidelines when 10 contacts are fully energized.
- Power contact resistance: ≤0.7 milli-ohms after environmental exposure

MECHANICAL PERFORMANCE

- Mating force:
  - 25 ounces per Power Contact
  - 3.5 ounces per Signal Contact

TECHNICAL DOCUMENTS

- Product Specification: GS-12-149
- Application Specification: BUS-20-067
- PwrBlade® Worksheets for custom design or layout
  - 51696 – Vertical header
  - 51697 – R/A header
  - 51698 – Vertical receptacle
  - 51699 – R/A receptacle

  Contact your local FCI representative to obtain these worksheets.

TOOLING

- For Press Fit tooling contact your local FCI Sales Representative

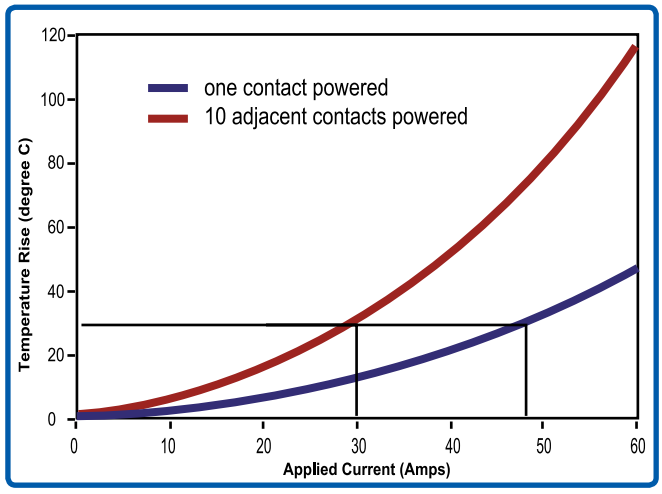
CERTIFICATIONS & APPROVALS

- UL ,CSA and TUV approved

PACKAGING

- Trays

TEMPERATURE RISE CURVE



Current rating information is in still air (no air flow) with multiple contacts energized unless otherwise noted

PART NUMBERS

MAIN PRODUCTS	PART REFERENCES
Power+Signal+Power Right Angle Header	51720-1XXXXXXXXXLF
Power+Signal+Power Vertical Header	51700-1XXXXXXXXXLF
Power+Signal+Power Right Angle Receptacle	51760-1XXXXXXXXXLF
Power+Signal+Power Vertical Receptacle	51740-1XXXXXXXXXLF

TECHNICAL INFORMATION

PART NUMBERS

MAIN PRODUCTS		PART REFERENCES
SERVER SYSTEM INFRASTRUCTURE (SSI STANDARD)		
High-End Power Supply (24 Signal + 12 Power Configuration)		
Server	Right Angle Receptacle	51416-001LF
	Vertical Press-Fit Receptacle	51666-001LF
Power Supply	Right Angle Header	51415-001LF
	Vertical Header	51952-001LF
	Vertical Press-Fit Header	51952-002LF
High-End Power Supply (12 Power + 24 Signal Configuration)		
Server	Vertical Receptacle	51261-XX001LF
	Vertical Press-Fit Receptacle	51617-XX002LF
Power Supply	Right Angle Header	51219-XX002LF
Mid-Range Power Supply (5 Power + 24 Signal + 6 Power Configuration)		
Server	Right Angle Receptacle	51625-XX001LF
	Vertical Press-Fit Receptacle	51667-XX001LF
Power Supply	Right Angle Header	51624-XX001LF
	Vertical Header	51860-001LF
	Vertical Press-Fit Header	51860-002LF

AC CABLE PORT RIGHT ANGLE RECEPTACLE	
Cable+Power+Signal+Power	51894-YYYLF
Cable+Signal+Power	51921-YYYLF
Cable+Power+Signal	51923-YYYLF

AC CABLE PORT VERTICAL RECEPTACLE	
Cable+Power+Signal+Power	51897-YYYLF
Cable	51897-YYYLF
Power+Signal+Cable	51897-YYYLF/51927-YYYLF
Cable+Power+Signal	51929-YYYLF

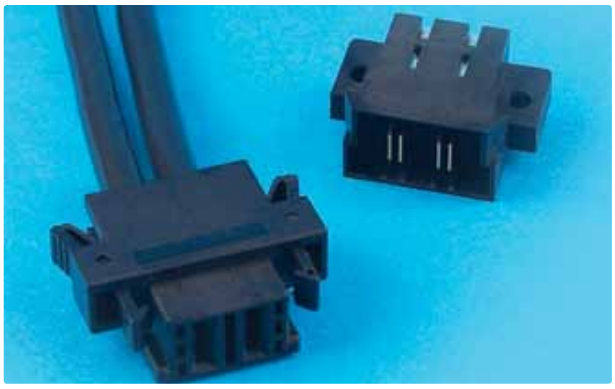
Note: The XX and YYY utilized in the part numbers above are placeholders for certain product specific criteria.
Reference the product drawings to obtain detailed dimensions and complete part numbers.
For non-SSI applications other configurations are available upon request.Please contact your local FCI representative.

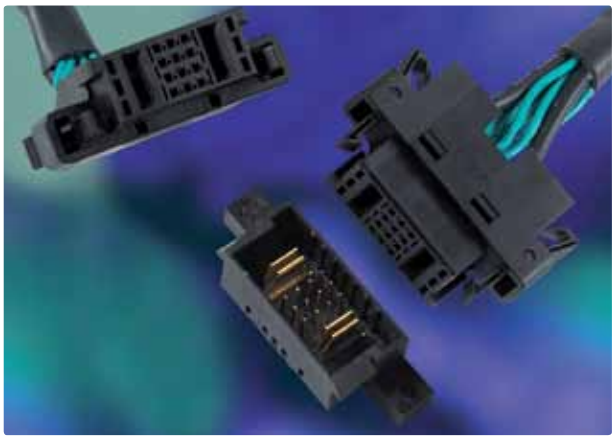
ASSOCIATED PRODUCTS AND CAPABILITIES

PWRBLADE® CABLE ASSEMBLIES

FCI offers PwrBlade® cable assemblies and connectors that are designed to mate to PwrBlade® right-angle or vertical board-mounted headers. By expanding beyond board-to-board applications, designers can now connect power supplies and power distribution subassemblies in a wider range of applications. The combination of cable connection capability with FCI's proven PwrBlade® board-to-board system provides a universal power distribution connector system.

FCI's PwrBlade® I/O connectors are available in squeeze-to-release form factors for applications that require active latching and in release and panel mount configurations for modular installation of large power distribution systems. PwrBlade® Cable Assemblies can be found on page 24.





FCI offers a wide range of power and signal PwrBlade® cables assemblies in both squeeze-to-release and panel mount configurations.
Please go to page 24 for more information.

HCI® CONNECTOR SYSTEM

DESCRIPTION

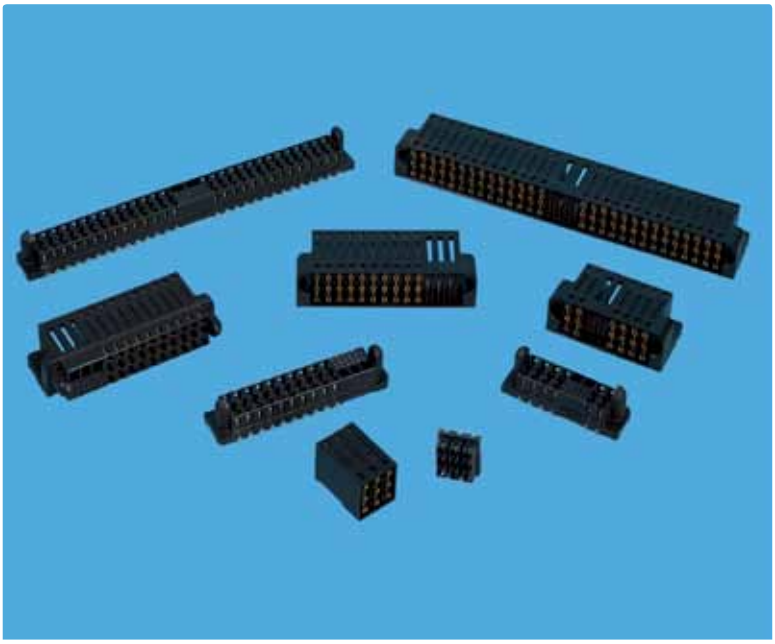
The HCI® connector system anticipates the continued trend toward increased system power demands that is driving the need for increased power density. The HCI® connector system is designed to address requirements that extend beyond the capability of FCI's proven PwrBlade® connector system, the industry standard for DC power supply interfaces and power distribution.

The HCI® connector system likewise provides capability for both power and signal contacts in a single connector to enable power distribution and power control. Integrated HCI® power connector solutions, enabling DC power, AC power, and signal contacts in a single molded housing, also provide incredible flexibility to address requirements for custom configurations.

The HCI® connectors employ stamped and formed power contacts, initially pioneered by FCI with its PwrBlade system, as an innovative and cost effective alternative to expensive screw-machined contacts for high-current applications.

The touch-proof HCI® housing is designed to optimize airflow. The housing permits airflow through the connector by providing vents above the signal field as well as vents above the power contacts that permit airflow away from the mated interfaces and along the entire length of the contacts.

Available HCI® options support standard coplanar (right-angle header to right-angle receptacle) and backplane (right-angle header to vertical receptacle) form factors.



FEATURES & BENEFITS

- Up to 82A/ power contact; at 30°C temperature rise in still air 95A/contact using UL test guidelines
- For high-wattage or high current density needs in power supplies & power distribution applications
- Provides power contacts for power distribution and signal contacts for power control
- Number and placement of power and signal contacts are highly configurable for custom power needs
- Power contact spacing options exist for AC (400V max) and DC (250V max) power
- Highly vented housing design maximizes airflow effects around and through the connector system
- Rugged, molded-in guides enable blind mating
- Connector housing does not overhang the board edge so the board-to-board spacing can be adjusted if needed
- Up to 3 levels of sequential contact including a short detect pin for hot swap applications
- Two and three position modules are available for use alongside the ZipLine®, AirMax VS® or Millipacs® Hard Metric-compatible connector series
- UL/CSA and TUV approved
- Board retention devices are provided to secure connectors during wave solder process
- AC cable port option (cable passthrough) as well as direct attach to busbars for power distribution are available
- Lead free plating is available for RoHS compliance

TARGET MARKETS / APPLICATIONS

- AC/DC pluggable power supplies in data, telecom & datacom/networking
- Industrial PCs
- Industrial controls & instrumentation
- Medical

TECHNICAL INFORMATION

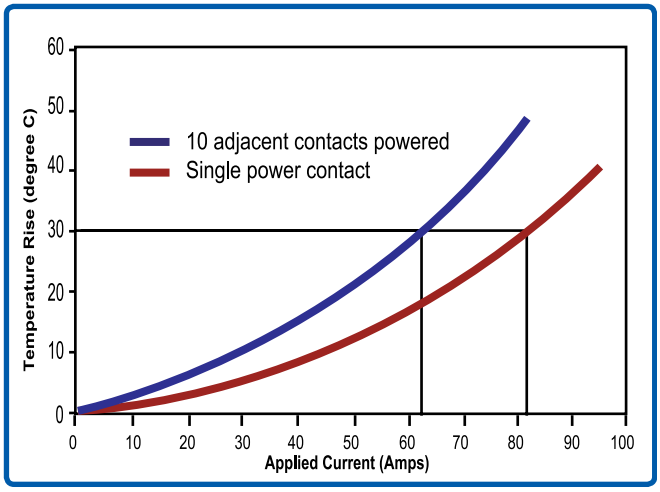
MATERIALS

- Housing: high-temperature thermoplastic (UL94V-0), black
- Contact base material:
  - Power – high-conductivity copper alloy
  - Signal – copper alloy
- Contact finish:
  - Separable interface: 30µin (0.76µm) performance-based plating over nickel
  - Board termination area: Matte tin over nickel

ELECTRICAL PERFORMANCE

- Current Rating
  - 62 Amps – 10 contacts fully energized at 30°C temperature rise in still air
  - 82 Amps – 1 contact fully energized at 30°C temperature rise in still air
- Power contact resistance: ≤0.5 milli-ohms after environmental exposure

TEMPERATURE RISE CURVE



Current rating information is in still air (no air flow) with multiple contacts energized unless otherwise noted

MECHANICAL PERFORMANCE

- Mating Force: The force to mate a receptacle connector and compatible header shall not exceed 36.5 ounces per power contact and 3.5 ounces per signal contact.
- Withdrawal Force: The withdrawal force shall not be less than 26 ounces per power contact and 0.64 ounces per signal contact.

TECHNICAL DOCUMENTS

- Product Specification
  - GS-12-380
- Application Specification
  - GS-20-070

APPROVALS AND CERTIFICATIONS

- UL-1977, CSA – 95 Amps per contacts with 10 contacts energized in still air
- TUV

PART NUMBERS

MAIN PRODUCTS	PART REFERENCES
2DC+16S+4DC Right Angle Header	10074864-003LF
2DC+16S+4DC Vertical Receptacle	10074866-001LF
20S+8DC Right Angle Header	10078546-001LF
20S+8DC Vertical Receptacle	10078548-001LF
10DC+24S Right Angle Header	10065864-003LF
10DC+24S Vertical Receptacle	10065127-001LF
11DC+24S Right Angle Header	10082091-003LF
11DC+24S Vertical Receptacle	10082093-001LF
7DC+24S+4DC Right Angle Header	10082722-001LF
7DC+24S+4DC Right Angle Receptacle	10082724-001LF
14DC+24S+14DC Right Angle Header	10084757-001LF
14DC+24S+14DC Vertical Receptacle	10084759-001LF

HARD METRIC HIGH-POWER CONNECTORS

Part of the AirMax VS® Connector Family

DESCRIPTION

These compact high-power connectors complement the AirMax VS high-speed signal connector offering. Contacts are flat except for minimal forming at the plug contact's mating interfaces, which enables the use of high conductivity base metal. The unique insulator design includes openings to help air flow around the contacts to improve heat dissipation. These design features contribute to the connectors' higher current-carrying capacity.

Each contact in a 1x2 connector module is designed to carry a maximum of 40 Amps, or a total of 80 Amps per module. Individual contacts in the 2x2 or 2x3 modules are designed to carry a maximum of 20 Amps. Reference the current rating chart for additional information.

The right-angle headers and vertical receptacles enable power connections at a backplane-to-daughtercard interface. Each header offers 2, 4, or 6 individual power contacts positioned in 1x2, 2x2, or 2x3 arrays. The backplane receptacles are offered in only 2x2 and 2x3 configurations; the 2x2 receptacle mates to either the 1x2 or 2x2 header configuration. The protected backplane receptacles are UL 60950 Compliant (Finger Probe).

Standard-profile 1x2 and 2x2 right-angle modules stand 14.7mm above the top surface of the PCB. The lower-profile 2x2 and 2x3 modules are designed to match the 11.5mm above-board height of AirMax VS 3-pair signal connectors. The lower vertical profile enables the power modules to be employed on the same 16.7mm slot pitch as the 3-pair signal connectors, or as a means to increase air flow in a chassis having wider slot spacing.

A 2x2 right-angle receptacle extends use to co-planar applications when used with a 1x2 or 2x2 right-angle header.

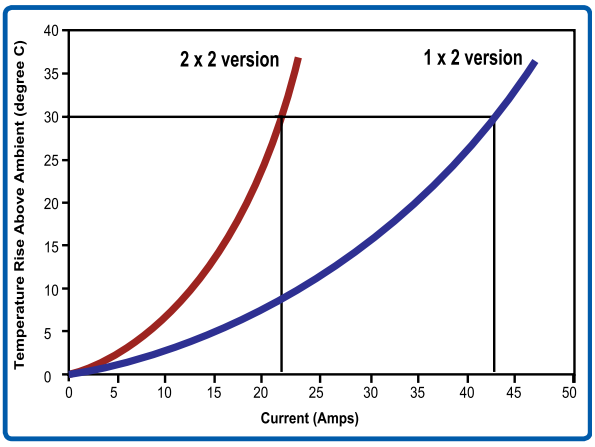
TARGET MARKETS / APPLICATIONS

- Data
  - Servers
  - Storage Devices
  - Computing Platforms
- Communications
  - Switches
  - Routers
  - Internet Equipment
- Medical
- Instrumentation

FEATURES & BENEFITS

- Current rating to 80 amps for 1x2 or 2x2 modules
- Hard Metric (HM) Equipment Practice
- Layout compatible with AirMax VS and Millipacs® connector series
- 1x2, 2x2 or 2x3 contact configurations for backplane applications
- Standard-profile 1x2 and 2x2 right-angle modules extend 14.7mm above the PCB
- Lower-profile 2x2 and 2x3 modules stand only 11.5mm above board
- Options for first-mate/last-break sequencing, 2 mating lengths available
- Protected Backplane connector UL 60950 Compliant (Finger Probe)
- Options for 1x2 or 2x2 Co-planar applications
- Press-fit termination
- Compatible with lead-free processing temperatures

TEMPERATURE RISE CURVE



Current rating information is in still air (no air flow) with multiple contacts energized unless otherwise noted

TECHNICAL INFORMATION

MATERIALS

- Housing: high-temperature thermoplastic (UL94V-0), black
- Contact base material:
  - Power – high-conductivity copper alloy
  - Signal – copper alloy
- Contact finish:
  - Separable interface: 30µin (0.76µm) performance-based plating over nickel
  - Board termination area: Matte tin over nickel

MECHANICAL PERFORMANCE

- Durability: 200 mating cycles
- Mating force: 31.2N maximum per 1x2 or 2x2 module
- Unmating force: 9.0N minimum per 1x2 or 2x2 module
- Press-fit insertion force: 67N maximum per individual contact tail

ELECTRICAL PERFORMANCE

- Voltage rating: 150V DC
- Contact Resistance: 1.0mΩ maximum
- Current Rating: Maximum amps per contact for different header and receptacle test configurations with dual (double sided) external copper pads of noted weight

SPECIFICATIONS

- Product Specification: GS-12-220
- Application Specification: GS-20-023
- Safety: UL 60950 & IEC 60950-1 Prevention of Operator Access to Energized Parts

ENVIRONMENTAL

- Per Central Office requirements, Telcordia GR-1217-CORE

APPROVALS AND CERTIFICATIONS

- Per Central Office requirements, Telcordia GR-1217-CORE

PACKAGING

- Tubes

Receptacle Type	Number of Connectors Fully Powered	Copper Pad Weight	Maximum Current Per Contact	
			1 x 2	2 x 2
Vertical Receptacle (2x2)	1	5oz	40A	20A
	Up to 5 adjacent	5oz	32A	14A
	1	2oz	32A	15A
	Up to 5 adjacent	2oz	27A	12A
R/A Receptacle (2x2)	1	2oz	37A	18A
	Up to 5 adjacent	2oz	29A	14A

PART NUMBERS

	Number of Contacts	Contact Array	Height Above PCB	Part Numbers	
				Vertical Receptacle	Right-Angle Header
Backplane Application	2	1x2	14.7mm	10028916-xxxxP00LF**	10028918-001LF
	4	2x2	14.7mm	10028916-xxxxP00LF**	10028917-001LF
	4	2x2*	11.5mm	10028916-xxxxP00LF**	10073379-001LF
	6	2x3*	11.5mm	10061290-xxxxxxPLF**	10061289-001LF
				Right-Angle Receptacle	Right-Angle Header
Co-planar Application	2	1x2	14.7mm	10052620-P00LF	10028918-001LF
	4	2x2	14.7mm	10052620-P00LF	10028917-001LF
	4	2x2*	11.5mm	10052620-P00LF	10073379-001LF

Notes: * indicates the connector set matches the above-board height of an AirMax VS 3-pair signal connector.

** xxxx and xxxxxx are placeholders for contact mating length combinations. Reference the product drawings for available options.

HCI® High Power Backplane/Midplane Connector System

DESCRIPTION

The HCI® High Power backplane/midplane connector series addresses applications demanding additional power at the interface between a daughter card and a backplane or midplane in chassis-based equipment platforms. The compact modules leverage proven, cost-effective stamped-and-formed HCI power contact technology to provide increased linear power density along the daughter card edge. In addition to conventional 1x2 and 1x3 power contact configurations, a 2-position module is available with an integrated guide between the power contacts.

HCI High Power modules are rated for up to 83A per contact without exceeding a 30°C temperature rise in still air. The modules address applications where current density requirements extend beyond those of FCI's established Hard Metric High Power Connector System.

These stand-alone modules are designed for use alongside other Hard Metric (HM) backplane/midplane connector families such as FCI's high-performance AirMax VS® and ZipLine™ connector systems or Millipacs® 2mm HM connectors. In fact, ZipLine and HCI High Power together offer the highest combination of signal and power density in the marketplace.

Individual power contacts are surrounded on four sides by molded housing walls to provide a distinct safety feature that prevents adjacent power contacts from shorting. The touch-proof housings are designed to optimize airflow around and through the connector by providing vents above and below the power contacts as well as along the rear of the housing.

FEATURES & BENEFITS

- Current rating to 83A/contact without exceeding a 30°C temperature rise in still air
- Design is compliant with the Hard Metric (HM) Equipment Practice and compatible with the ZipLine®, AirMax VS® and Millipacs® connector series
- Connector housing does not overhang the board edge so the board-to-board spacing can be adjusted if needed
- Two- and three-position modules support backplane or midplane applications
- The two-position module with integrated center guide can eliminate the need for separate guidance
- Housing walls surround the power contacts to ensure that adjacent contacts cannot short together
- Two contact mating length options provide capability for sequentially mating power and ground contacts
- Protected backplane/midplane receptacle is UL 60950 compliant (Test Finger & Test Probe)
- Press-fit termination is available for thicker, higher-layer-count boards
- Compatible with lead-free processing temperatures

TARGET MARKETS / APPLICATIONS

- Data – servers & storage enclosures
- Telecommunications
- Datacom/Networking
- Industrial controls & instrumentation
- Medical

TECHNICAL INFORMATION

PHYSICAL

- Housing: High-temperature thermoplastic, black
- Flammability rating: UL 94 V-0
- Contact material: High-conductivity copper alloy
- Contact finish:
  - Separable interface: 30µin (0.76µm) performance-based plating over nickel (per the GS-12-380 product specification)
  - Press-fit tail area: Matte tin over nickel

ELECTRICAL PERFORMANCE

- Current rating: 83A/contact maximum at 30°C T-rise in still air
- Operating voltage: 300V maximum
- Dielectric withstanding voltage: 2500V DC
- Insulation resistance: >10,000 MΩ minimum
- Contact resistance: <0.5 mΩ initially as well as after environmental exposure

MECHANICAL PERFORMANCE

- Mating force: 40N maximum for 2-position; 60N maximum for 3-position
- Unmating force: 13N minimum for 2-position; 19.5N minimum for 3-position
- Contact wipe distance: 3.11mm minimum
- Durability: 200 mating cycles

ENVIRONMENTAL

- Operating temperature: -65°C to + 105°C
- RoHS information, this product is compatible according to the European Union Directive 2002/95/IEC

REFERENCE DATA

- Product Specification: GS-12-380
- Application Specification: GS-20-070

CERTIFICATIONS & APPROVALS

- UL-95A per contact in still air
- CSA
- TUV

PACKAGING

- Right angle headers: Tubes
- Vertical receptacles: Tubes

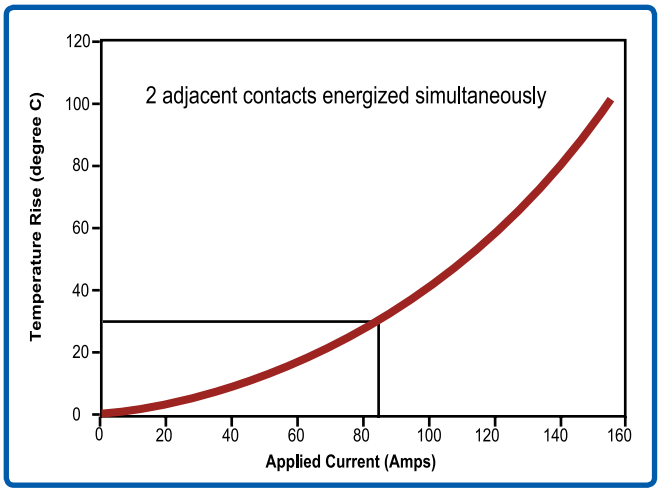
PART NUMBERS

1x2 Right Angle Header w/o Integrated Guide	10078770-001LF
1x2 Vertical Receptacle w/o Integrated Guide	10078768-001LF
1x2 Right Angle Header w/ Integrated Guide	10087937-001LF
1x2 Vertical Receptacle w/ Integrated Guide	10087939-001LF
1x3 Right Angle Header	10078904-001LF
1x3 Vertical Receptacle	10078902-001LF

Note: For right angle headers with one first mate/last break contact, please use the -002LF dash number option per the applicable product drawing.

www.fci.com/hcihighpower

TEMPERATURE RISE CURVE



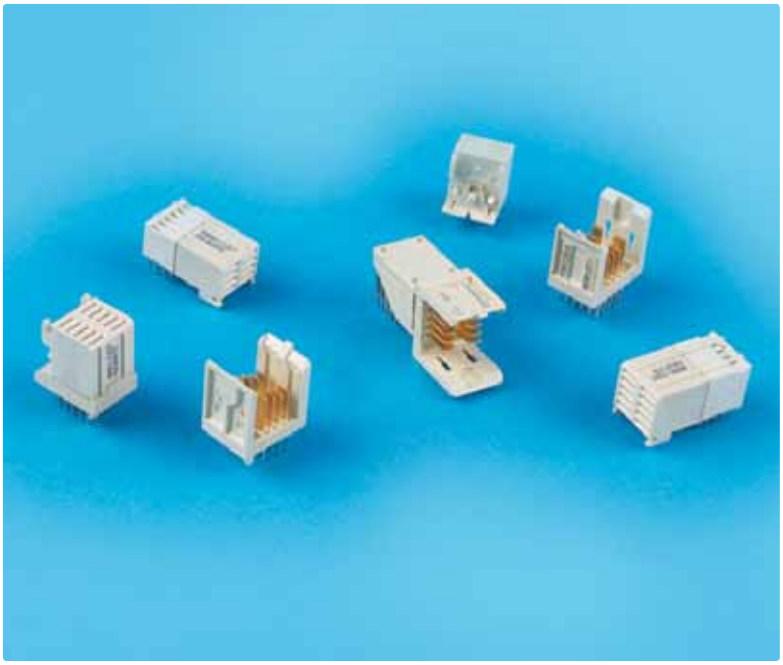
Current rating information is in still air (no air flow) with multiple contacts energized unless otherwise noted

METRAL® POWER CONNECTORS

Part of the Metral® Backpanel Connector Family

DESCRIPTION

The Power Connectors are functional building blocks in the Metral® modular backplane interconnect system. All connectors are designed in accordance with the IEC 61076-4-104 standard. The comprehensive connector range in the Metral® family supports power solutions in combination with other functions like signal and coax. Each power module provides 8 or 10 individual contacts, and each contact designed to carry 3 amps current. The available termination options support press-fit or solder-to-board application. Other options provide capability for rear plug-up or staggered pin lengths to support sequential mating. Easy-to-use and cost-effective application equipment is available for press-fit connectors to keep assembly times, as well as production costs, to a minimum.



FEATURES & BENEFITS

- 3 Amps per individual power contact
- Designed in accordance with IEC 61076-4-104
- Modular design offers system design flexibility
- Stackable end-to-end with other Metral modules without loss of positions
- 12 mm wide power modules are form and fit interchangeable with signal modules on the same footprint
- “Eye-of-Needle” compliant section provides gas-tight, press-fit termination
- First-Make-Last-Break options that enable sequential mating are available in the vertical header
- RoHS-compliant options aid compliance with environmental regulations

TARGET MARKETS / APPLICATIONS

- Communication
- Instrumentation
- Medical

TECHNICAL INFORMATION

MATERIALS

- Housing: Liquid Crystal Polymer (UL-94 V-0)
- Terminal: Phosphor Bronze
- Plating:
  - Separable interface: Gold or GXT™
  - Solder tails: Tin over Nickel
  - Press-fit: Tin over Nickel and Tin-Lead over Nickel

ELECTRICAL CHARACTERISTICS

- Current rating: 3 Amps nominal (4 Amps Max) current per contact
- Withstanding Voltage: 1000 VAC
- Insulation resistance: > 5000MΩ (> 1000MΩ after environmental exposure)

PERFORMANCE

Per Telcordia GR1217-CORE, Central Office requirements

APPROVALS AND CERTIFICATIONS

- Underwriters Laboratories Inc. (UL file no. E66906)
- Canadian Standards Association (CSA file no. LR46923)

MECHANICAL CHARACTERISTICS

- Insertion force: 1.5 N max per individual contact
- Withdrawal force: 0.3N min per individual contact
- Durability: 200 cycles (Telcordia)
- Temperature: -55°C to +105°C

PACKAGING

- Headers Vertical: Tube
- Headers Right Angle: Tray
- Receptacles Right Angle: Tube

PART NUMBERS

Description	Termination	Base Number	
		4 Rows (8 contacts)	5 Rows (10 contacts)
Header, vertical	Press-fit	70236	89099
Header, right-angle	Press-fit	HM1K41	HM1K51
Receptacle, right-angle	Press-fit	88949	89096
Receptacle, right-angle	Solder	89039	85876
Receptacle, vertical	Solder	93239	94561

METRAL® HIGH-POWER CONNECTORS

Part of the Metral Backpanel Connector Family

DESCRIPTION

These compact high-power connectors complement the Metral® Standard Signal and Power connector offering. The right-angle headers and vertical receptacles enable high-power connections at the backpanel to daughtercard interface. Each high-power module provides either 2 or 4 individual contacts positioned in a 1x2 or a 2x2 array. Each connector module is designed to carry up to 80 amps current. The chart under Electrical Performance provides more detailed information on current rating. The unique insulator design includes openings to help air flow around the contacts to improve heat dissipation.

FEATURES & BENEFITS

- Available in 1x2 or 2x2 contact configurations
- Rated for up to 80 Amps current for a single module
- Voltage Rating: 150V
- Receptacle connectors can be provided with two contact lengths to enable first-mate/last-break sequencing
- Protected backpanel receptacle connector is UL 60950 (Finger Probe) compliant
- Layout compatible with Metral 2mm backpanel connector family
- Press-fit termination

TARGET MARKETS / APPLICATIONS

- Data
  - Servers
  - Storage Devices
  - Computing Platforms
- Communications
  - Switches
  - Routers
  - Internet Equipment
- Medical
- Instrumentation

TECHNICAL INFORMATION

MATERIALS

- Housing: high-temperature thermoplastic (UL94V-0), black
- Contact base material:
  - Power – high-conductivity copper alloy
  - Signal – copper alloy
- Contact finish:
  - Separable interface: 30µin (0.76µm) performance-based plating over nickel
  - Board termination area: Matte tin over nickel

ENVIRONMENTAL

Per Telcordia Central Office requirements

MECHANICAL PERFORMANCE

- Mating force: 31.2N max per connector
- Unmating force: 9.0N min per connector
- Press-fit insertion force: 67N max per individual contact tail

SPECIFICATIONS

- Product Specification
  - GS-12-220
- Application Specification
  - GS-20-023
- Safety
  - UL 60950 & IEC 60950-1 Prevention of Operator Access to Energized Parts

PACKAGING

- Tubes

ELECTRICAL PERFORMANCE

Number of Connectors Fully Powered	Copper Pad Weight	Current Ratings (maximum amps per contact)	
		1 x 2	2 x 2
1	5oz, double sided	40	20
Up to 5 adjacent	5oz, double sided	32	14
1	2oz, double sided	32	15
Up to 5 adjacent	2oz, double sided	27	12

PART NUMBERS

Part Number	Description
10009536-001	Vertical receptacle, 8.0mm mating length
10009536-002	Vertical receptacle, 6.5mm mating length
10025058-XXXX	Vertical receptacle, “XXXX” designates FMLB (First Mate, Last Break) loading pattern options
10009542-001	Right-angle header, 2x2 Contacts
10009556-001	Right-angle header, 1x2 Contacts

Notes:

- Each receptacle can be used with either header. See product drawings for additional information.
- Add a “LF” suffix to the part number to designate Lead-Free and RoHS-compliant options.

Pwr Profile+™

Low Profile I/O Cable Assemblies

DESCRIPTION

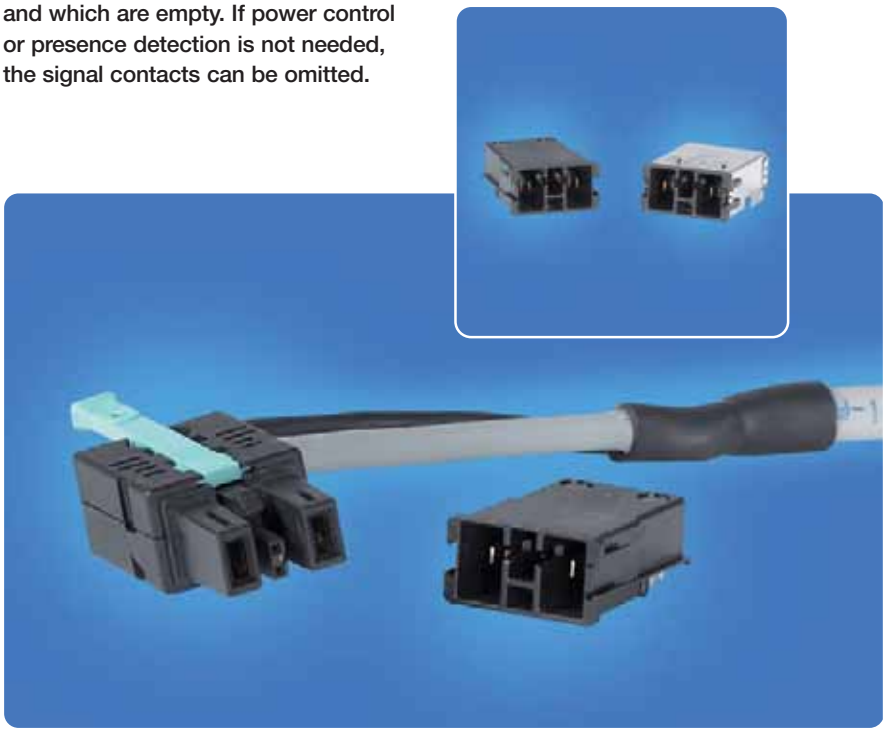
Pwr Profile+™ I/O cable assemblies and mating board mount headers are a low profile (8.38mm height) and high current density alternative to existing cable-to-board power connector solutions. Pwr Profile+™ is based on very cost effective and highly reliable stamped-and-formed power contact technology similar to other power solutions from FCI.

Pwr Profile+™ incorporates an innovative power contact design that permits a more compact, lower profile package for demanding cable-to-board applications. Pwr Profile+™ addresses applications requiring additional power density where a need exists to distribute power via cabling in space-constrained, chassis-based equipment platforms.

Pwr Profile+™ is available with two power contacts (for power and return applications), two signal pins for presence detection or power control and a grounding shield on the board connector for EMC requirements. The grounding shield is optional so it can be omitted if the application does not have EMC concerns.

The signal pins for power control are very useful for applications that require current/voltage monitoring and/or feedback regarding battery charge levels (in the case of a battery back-up application). The presence detection feature includes a jumpered signal contact that allows the system to monitor which ports have mated cables and which are empty. If power control or presence detection is not needed, the signal contacts can be omitted.

Pwr Profile+™ is rated to 37A per contact without exceeding a 30˚C temperature rise in still air.
The integrated latching system minimizes the connector/cable footprint and the robust housing design includes touch-proof safety features as well as polarization to ensure proper mating.



FEATURES & BENEFITS

- Current rating to 37A/contact for two power contacts without exceeding a 30˚C temperature rise in still air
- Compact design is ideal for limited space applications
- Low 8.38mm profile height maximizes airflow for system cooling
- Vented cable housing design maximizes heat dissipation
- Two signal contacts are available for presence detection or power control
- Integrated latching system minimizes connector/cable footprint
- Robust design includes touch-proof safety features that are IEC 60950 compliant
- Polarized housing design ensures proper mating
- Compatible with lead-free processing temperatures

TARGET MARKETS / APPLICATIONS

- Power I/O & distribution in data, telecom & datacom/networking
- Uninterruptible power supplies (UPS)
- Battery & power strip monitoring
- Industrial controls & instrumentation
- Medical

TECHNICAL INFORMATION

MATERIALS

- Housing: high-temperature thermoplastic (UL94V-0), black
- Contact base material:
  - Power – high-conductivity copper alloy
  - Signal – copper alloy
- Contact finish:
  - Separable interface: 30µin (0.76µm) performance-based plating over nickel
  - Board termination area: Matte tin over nickel

ELECTRICAL PERFORMANCE

- Current rating: 37A/contact maximum at 30°C T-rise in still air
- Operating voltage: Up to 300V maximum
- Dielectric withstanding voltage: 1000V
- Insulation resistance
  - Power contacts: > 5,000 MΩ initially
  - Signal contacts: > 500 MΩ initially
- Contact resistance
  - Power contacts: ≤ 2.0 mΩ initially as well as after environmental exposure
  - Signal contacts: ≤ 30 mΩ initially as well as after environmental exposure

MECHANICAL PERFORMANCE

- Contact wipe distance
  - Power contacts: 4.8mm minimum
  - Signal contacts: 1.5mm minimum
- Durability: 200 mating cycles

ENVIRONMENTAL

- Operating temperature: -55°C to + 105°C
- RoHS information, this product is compatible according to the European Union Directive 2002/95/IEC

TERMINATION

- Power wire size: 6 mm²
- Signal wire sizes: 22AWG, 24AWG and 26AWG

SPECIFICATIONS

- Product Specification: GS-12-594

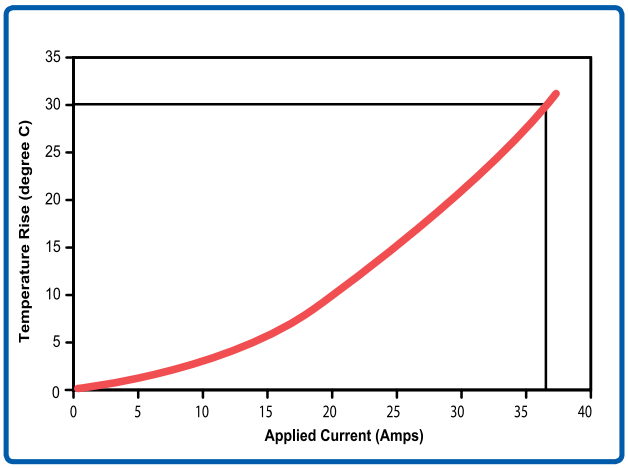
CERTIFICATIONS & APPROVAL

- UL – in process
- CSA – in process
- TUV – in process

PACKAGING

- Right angle header: Tape-and-reel or trays

TEMPERATURE RISE CURVE



Current rating information is in still air (no air flow)
with multiple contacts energized unless otherwise noted

PART NUMBERS

Right Angle Board Mount Headers	
1P+2S+1P Header (w/ Ground Shield)	10089872-101LF
Cable Receptacle Assembly	
1P+2S+1P Receptacle – 6mm² Wire, 1m Cable Length & Jumpered Signal Contacts	10105849-40100DYLF

PWRBLADE® CABLE ASSEMBLIES

DESCRIPTION

The PwrBlade® cable connectors are designed to mate to PwrBlade® right-angle or vertical board-mounted headers. By expanding beyond board-to-board applications, designers can now connect power supplies and power distribution subassemblies in a wider range of applications. The combination of cable connection capability with FCI's proven PwrBlade board-to-board system provides a universal power distribution connector system.

FCI's PwrBlade® connectors are available in squeeze-to-release form factors for applications that require active latching and in panel-mount configurations for modular installation of large power distribution systems.

The PwrBlade® power distribution connector system provides both power and signal contacts to enable power distribution and power control in a single connector. Initially developed to enable the implementation of Server System Infrastructure (SSI) Standards for Distributed Power Supplies (DPS), Mid-range Power Supplies (MPS) and High-end Power Supplies (HPS), PwrBlade connectors are also available in wide variety of other configurations. The connectors can also be customized to address unique application requirements.

FEATURES & BENEFITS

- 48A/individual power contact; 30A/contact for 10 adjacent contacts at 30°C temperature rise in still air
- Right angle board connector enables front I/O applications
- Vertical board connector enables power distribution to mid-board components
- Panel-mount option or squeeze-to release latches are available to accommodate various system configurations
- Supports multiple wire sizes including 8 - 14 AWG wire for power contacts and 22 - 26 AWG for signal contacts
- Power contact spacing options exist for AC (300V max) or DC (200V max) power
- Provides power contacts for power distribution and signal contacts for power control
- Number and placement of power and signal contacts are highly configurable for custom power needs
- Rugged, molded-in guides on panelmount version enable blind mating
- Polarized housing design ensures proper mating
- Up to 3 levels of sequential contact including a short detect pin for hot swap applications
- Lead free plating is available for RoHS compliance

TARGET MARKETS

- Data
- Telecommunications
- Datacom/Networking
- Industrial/Instrumentation

APPLICATIONS

- Power I/O & distribution in data, telecom & datacom/networking
- Uninterruptible power supplies (UPS)
- Industrial controls & instrumention
- Medical

TECHNICAL INFORMATION

MATERIALS

- Housing: high-temperature thermoplastic (UL94V-0), black
- Contact base material:
  - Power – high-conductivity copper alloy
  - Signal – copper alloy
- Contact finish:
  - Separable interface: 30µin (0.76µm) performance-based plating over nickel
  - Board termination area: Matte tin over nickel

ELECTRICAL PERFORMANCE

- Insulation resistance: 20MΩ min.
- Withstanding voltage: 1,200 V RMS
- Current rating: 48 A for single powered contact; de-rated to 30A for 10 powered contacts at 30°C temperature rise with zero airflow
- Current rating: 60A for 10 contacts when tested to UL guidelines.
- Power contact resistance: ≤2.0 milli-ohms after environmental exposure

MECHANICAL PERFORMANCE

- Mating force: 12 lbs. typical for 11 power, 24 signal configuration

ORIENTATION

- Squeeze-to-Release latching
- Floating Blind-Mate Panel-Mount

TERMINATION

- Power wire sizes: 8 AWG, 10 AWG, 12 AWG & 14 AWG
- Signal wire sizes: 22 AWG, 24 AWG, 26 AWG

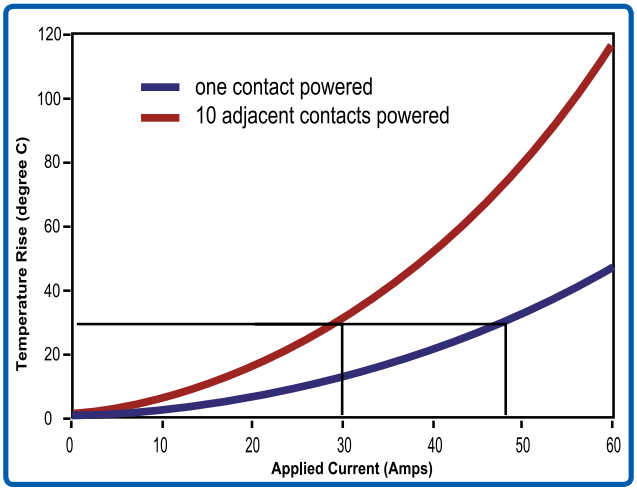
SPECIFICATIONS

- Product Specification: GS-12-474
- Application Specification: GS-20-092

CERTIFICATIONS & APPROVALS

- UL ,CSA and TUV approved

TEMPERATURE RISE CURVE



Current rating information is in still air (no air flow)
with multiple contacts energized unless otherwise noted

PART NUMBERS

MAIN PRODUCTS	PART REFERENCES
2P Right Angle Board Mount Header	51939-198LF
2P Cable Receptacle w/ Squeeze-To-Release Latches (8 AWG wire; 1 m cable length)	10080594-1AD0078LF
24S+6P Right Angle Board Mount Header	51721-10002406AALF
24S+6P Cable Receptacle For Panel-Mount (10 AWG wire; 1 m cable length)	10080591-HAB0023LF

Contact your local FCI sales representative for cable assemblies

PWR TWINBLADE® I/O CABLE ASSEMBLIES

DESCRIPTION

The Pwr TwinBlade® cable system is designed to support applications that demand the supply of high power. The Pwr TwinBlade® connectors employ a proven contact system in a touch-proof design that is capable of supporting currents of up to 100 Amps per twin contact. The system consists of cable connectors in orientations of right angle or straight cable exits mating to a right angle board connector.

Other connector features include an active latch, four different coding options and polarization to ensure proper mating. The design provides capability for termination of various cable diameters and wire sizes of 2 x 6 mm², 10 mm², 16 mm² and 25 mm². FCI is able to provide the industry with component cable kits as well as cable assemblies terminated with Pwr TwinBlade® connectors.

FEATURES & BENEFITS

- Up to 100A/twin contact for two conductors at 30°C temperature rise in still air
- Right angle board connector enables front I/O applications
- Straight and right angle cable exit options facilitate routing flexibility
- Supports multiple wire sizes including 10 mm², 16 mm² or 25 mm² wire as well as 2 x 6 mm² wires
- Rated up to 300V DC for higher voltage applications
- Robust connector design includes touch-proof safety features
- Integrated latching system minimizes connector/cable footprint
- Polarized housing design ensures proper mating
- Four coding options allow keying to block insertion of incorrect cables
- Lead free plating is available for RoHS compliance

APPLICATIONS

- Power I/O & distribution in data, telecom & datacom/networking
- Uninterruptible power supplies (UPS)
- Industrial controls & instrumention

TECHNICAL INFORMATION

MATERIALS

- Power Contact Base Material
  - High conductivity copper alloy
- Board Connector and Cable Connector Housings
  - High temperature nylon
- Plating
  - Seperable interface: 0.76 µm (30 µin.) Performance based plating over nickel

ELECTRICAL PERFORMANCE

- 100 Amps per twin contact at 75°C ambient
- Operating Voltage: 80 Volts DC at 25 Amps
- Short Circuit Capacity: 5 operations carrying 3000 Amps for 10ms
- Insulation Resistance: 1GΩ when measured in accordance with EIA 364 TP 21
- Connector Rating: 2kW. 100A@20V to 25A@80V

MECHANICAL/ENVIRONMENTAL PERFORMANCE

- Insertion Force: shall not exceed 40N
- Withdrawal Force: shall not be less than 15N
- Durability: 50 cycles
- Operating Temperature Range: -20°C to +75°C

TERMINATION

- Power wire sizes:
  2 x 6 mm^2, 10 mm^2, 16 mm^2 and 25 mm^2

SPECIFICATIONS

- Product Specification: GS-12-389

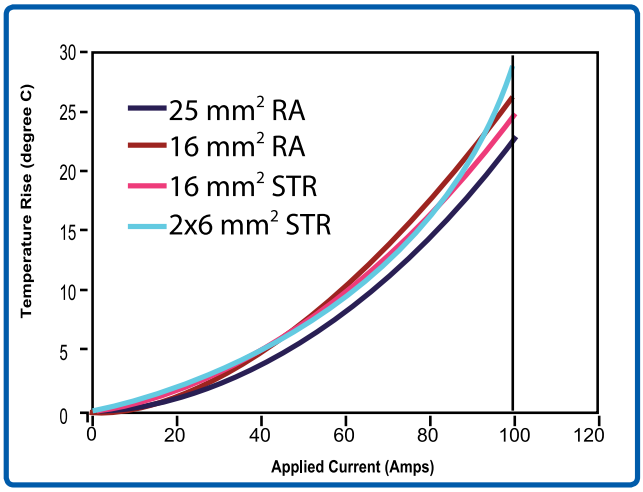
CERTIFICATIONS & APPROVALS

- UL 1977
- Touch-proof per IEC 60998-1 and IEC60668-2

PACKAGING

- Trays

TEMPERATURE RISE CURVE



Current rating information is in still air (no air flow)
with multiple contacts energized unless otherwise noted

PART NUMBERS

MAIN PRODUCTS	PART REFERENCES
Right Angle Board Mount Header	51939-219LF
Right Angle Exit Cable Receptacle Assembly (10 mm^2 wire; 1 m cable length)	10080068-4FEL100LF
Right Angle Exit Cable Receptacle Assembly (16 mm^2 wire; 1 m cable length)	10080068-4GEL100LF
Right Angle Exit Cable Receptacle Assembly (25 mm^2 wire; 1 m cable length)	10080068-4HEL100LF
Straight Exit Cable Receptacle Assembly (16 mm^2 wire; 1 m cable length)	10080068-2GEL100LF

Reference the product drawings to obtain detailed dimensions and complete part numbers.

Contact your local FCI sales representative for cable assemblies

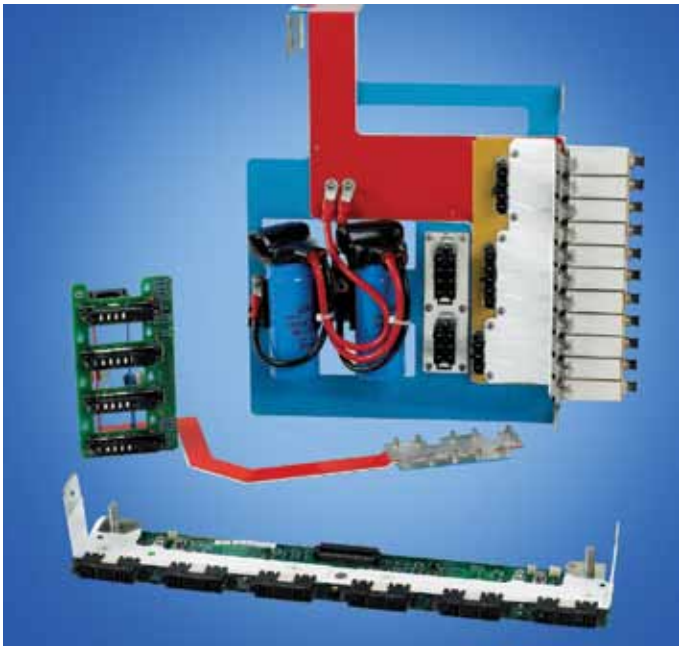
POWER DISTRIBUTION SOLUTIONS

Integrated systems including bus bars, connectors, cables, PCBs, and other components

DESCRIPTION

FCI Power Distribution Solutions are based on laminated bus bar technology that provides predictable, repeatable and reliable electrical performance.
From simple to complex power distribution requirements, FCI can design a system that saves space, lowers cost and provides pluggable modularity to allow equipment expansion or upgrades.
Our Power Distribution Solutions are engineered for easy connectivity. FCI 's expertise and wide selection of connectors and cable assemblies, including FCI 's popular PwrBlade®, HCI ®, and HPCE ™ power supply interconnects and Pwr TwinBlade™, PwrBlade®, and Pwr Profile+™ power cable solutions, make it easy to quickly connect power to a backplane or other system boards for easy installation.

FCI has been a leader in power distribution technology for over 20 years and offers full in-house design and modeling capabilities along with a global manufacturing footprint.
FCI combines a broad line of power products with the ability to engineer new solutions as required. The result is a cost-effective approach that blends custom engineering with off-the-shelf connectors and cable assemblies to address a wide range of power distribution needs.



FEATURES & BENEFITS

- Broad range of power connector solutions includes high current density and low contact resistance products, touch-proof designs, low-profile solutions and options with integrated signal contacts for power control
- Customized designs integrate connectors and other components such as PCBs, breakers, switches, capacitors and cables
- Low inductance, distributed capacitance and low resistance minimize impedance, voltage drop, and noise
- Integration of a bus bar can replace thick copper traces and reduce board layers
- Improved thermal characteristics compared to cables
- More efficient utilization of cabinet space and less complexity com pared to wire harnesses
- Simplified designs can reduce component count and cost
- Fast, error-free and cost-effective installation and lower field service costs
- Improved quality results from predictable and repeatable electrical performance
- Design capability includes analysis of current flow, thermal characteristics, voltage drop and inductance to ensure maximum efficiency

TARGET MARKETS / APPLICATIONS

- Communications
  - Wireless base stations
  - Switches
  - Routers
- Data
  - Servers
  - Supercomputers
  - Storage Systems
- Industrial
  - Power supplies
  - Medical scanners
  - Electrical cabinets (switchgear)

COST EFFECTIVE

- Fewer conductors can feed a common voltage to multiple outputs optimizing use of available cabinet space
- Can replace thick copper traces and can reduce backplane or board layers
- Reduction in overall component count and cost
- Enables quick and easy installation into a cabinet
- Eliminates complicated wiring and can eliminate wiring installation errors
- Enables quick and easy system maintenance and field service

ELECTRICAL PROPERTIES

- High current density – 5 A / mm^2 – well suited for fuse racks, power distribution assemblies (PDAs) or power distribution units (PDUs)
- Clean power distribution enabled by high capacitance and low inductance
- High voltage distribution – up to 4 kV – with low resistance and low voltage drop
- Multiple voltages accommodated by laminated designs
- Wide range of standard insulating films and coatings are available
- Predictable, repeatable performance

THERMAL MANAGEMENT ADVANTAGES

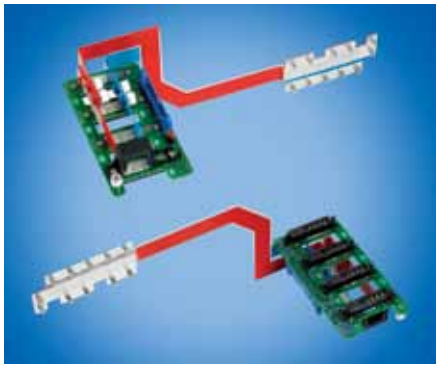
- Wide thin copper sheet dissipates heat more efficiently than round cable
- Lower profile increases airflow compared to power harnesses and cables
- Greater power density can often be achieved with less temperature rise compared to cable

MECHANICAL PROPERTIES

- Capability for customized profiles and shapes for efficient use of cabinet space and PCB surface
- Can be formed to fit in small areas or in corners where bend radius complicates use of cables
- Requires less space than a wire harness
- Integrates functional components related to power distribution such as breakers, switches, capacitors, connectors, PCBs and cables
- Wide variety of available connection methods, including power interconnect solutions with increased current density and lower contact resistance, touch-proof designs, low-profile solutions, and connector systems offering capability to integrate signal contacts for power control or sensing
  - Commonly-used power supply interconnects, such as PwrBlade®, HCI®, or HPCE™ power card edge connectors
  - Soldered or ultrasonically welded cables with lugs or power I/O connectors, such as Pwr TwinBlade™, PwrBlade®, and Pwr Profile+™ cable connectors
  - Clinch studs/nuts, blades, holes/bolts, other terminals
  - Transfer PCBs
- Provides stable structure for additional components
- Neat, attractive appearance

ADDITIONAL INFORMATION

- **For more information, visit www.fciconnect.com/powerdistribution or contact powerdistribution@fci.com**



Server application uses PwrBlade® connectors as the interface to pluggable AC/DC power supplies and a bus bar to distribute power within the rack unit

Power distribution unit for a wireless base station distributes power to a bank of circuit breakers

Server application includes PwrBlade® connectors as the interface to AC/DC power supplies, power management components, and a bus bar for power distribution

D-SUBMINIATURE POWER CONNECTORS

DESCRIPTION

The D-Subminiature power connector range is a standard interface widely used in many market segments. FCI offers connector options that accommodate either all Power or mixed Power and Signal contacts. The connector form factors are directly inspired by those of the traditional D-subminiature signal connectors, long used as standard I/O connectors in many types of electronic equipment. The power connectors are also principally used for I/O solutions because of their robust and shielded design.

The product family includes many versions, all using standard metal shell dimensions, providing great flexibility to the system design engineer:

• All power contacts: 2V2 (2 power contacts, coded version), 3V3 (3 power contacts, coded version), 3W3 (3 power contacts), 5W5 (5 power contacts) and 8W8 (8 power contacts)

• Mixed signal and power contacts: 5W1 (5 contacts of which 1 power and 4 signal contacts), 11W1, 7W2, 21W1, 17W2, 13W3, 9W4, 25W3, 21WA4, 27W2, 47W1, 24W7 and 36W4.

FEATURES & BENEFITS

- PCB connectors:
  - Both socket and pin genders
  - Right-angle and straight versions
  - Traditional solder-to-board or press fit termination.
  - Pin-In-Paste (PIP) can be offered on request.
  - Right-angle connectors can be provided with connector heights and footprints that conform to either European version (stand-off 7.2 mm and pitch 2.54 mm) or US version (stand-off 6.3 mm and pitch 2.84 mm) requirements
  - Large choice of front accessories (threaded inserts, screw locks) and PCB accessories (metal brackets, harpoons)
- Cable connectors:
  - Both socket and pin genders
  - Signal solder bucket contacts are pre-assembled in the connector.
  - Power contacts are sold and assembled separately in solder bucket or crimp versions.
  - Large choice of plastic, metalized plastic and metal hoods with straight or angled cable exits.
- RoHS-compliant options aid compliance with environmental regulations

TARGET MARKETS / APPLICATIONS

- Telecommunications
- Instrumentation/Industrial
- Medical
- Datacom

TECHNICAL INFORMATION

MATERIALS

- Thermoplastic (UL-94 V-0)
- Color: Green
- Applicable Soldering Process: Lead-free wave soldering compatible
- Contact area plating (Signal and power): Gold over nickel
- Termination area plating (Signal and power):
  - Power: Tin over Nickel
  - Signal: Gold over Nickel

MECHANICAL PERFORMANCE

- Insertion Force: ≤ 5N per contact
- Extraction force: ≥ 0.3N per contact
- Durability: 200 mating/un-mating cycles or 500 mating/un-mating cycles
- Temperature Range: from -55°C to 125°C

SPECIFICATIONS

- Centerline Spacing (Signal and Power): 2.54mm or 2.84mm

ELECTRICAL PERFORMANCE

- Current Rating:
  - Power contacts: from 10A to 40A max. per contact for 30°C temperature rise in still air
  - Signal contact: 7.5A max. per contact measured at 30°C temperature rise in still air
- Insulation Resistance: 5000MΩ min. for power and signal contacts
- Withstanding Voltage: 1000V RMS 50Hz for power and signal contacts
- Contact Resistance: ≤ 7.3mΩ per contact for power and signal contacts

APPROVALS AND CERTIFICATIONS

- UL Approved

PACKAGING

- Trays

PART NUMBERS (EXAMPLES)

Right Angle Solutions

Connector Configurations	PCB Connectors	Cable Connectors	Power Contacts	Hoods/Backshells
3W3 (3 power)	DAV3W3P500G40LF	DA3W3SA00LF	8638SS4005LF: 40A socket, solder bucket version	8655MH1511LF: 3W3 or 7W2 (size A) Metal hood, straight exit
7W2 (2 power + 5 signal)	DA7W2S743H30LF	DA7W2PA00LF	8638PPC1005LF: 10A pin, crimp version	

Straight Solutions

Connector Configurations	PCB Connectors	Cable Connectors	Power Contacts	Hoods/Backshells
5W5 (5 power)	DBV5W5P300G40LF	DB5W5SA00LF	8638PPS4005LF: 40A, pin, solder bucket version	86303639BLF: 5W5 (size B) Plastic hood, straight exit
8W8 (8 power)	DCO8W8S300G30LF	DC8W8PA00LF	8638PSC3005LF: 30A, socket crimp version	8655MHRA3701LF: 8W8 (size C) Metal hood, right angle exit

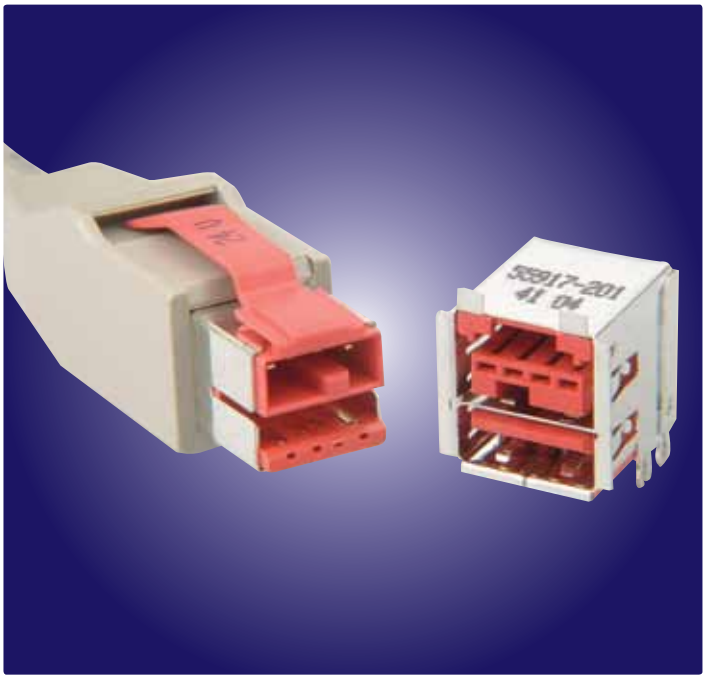
Contact your local FCI sales representative for cable assemblies

USB + POWER CABLE ASSEMBLIES

DESCRIPTION

The USB + Power interconnect system was developed by FCI to address higher power requirements of devices using USB signaling. USB + Power adds 4 power contacts to the interface providing a total of 5 amps of additional current carrying capability compared to 1 amp for standard USB. For many devices, this eliminates the requirement for a separate power source reducing the number of cables required. For peripherals not requiring the additional current, the USB + Power receptacle will mate with a standard USB 'A' plug.

To insure proper mating, USB + Power is individually keyed and color coded for 5V, 12V, and 24V.



FEATURES & BENEFITS

- Provides up to 5 amps of current carrying capacity eliminating the need for an external power supply in most peripheral devices
- Receptacle mates with standard USB 'A' plug
- Keyed and color coded for different voltages
- Positive latching insures proper mating and retention
- Fully shielded providing USB 2.0 data performance
- Hot plugging capability

TARGET MARKETS / APPLICATIONS

- Data
- Consumer
- Datacom/Telecom
- PC
- Point of sale
- Hubs
- Speakers

TECHNICAL INFORMATION

MATERIALS

- Receptacles
  - Housing: high temperature thermoplastic UL94V-O rated
  - Contacts: Copper Alloy
  - Shell: Copper Alloy
- Cables
  - Cable jacket: PVC
  - Contacts: Copper Alloy
  - Data conductors: 28 AWG twisted pair
  - Power conductors: non-twisted pair
  - Shield: aluminized foil and 65% coverage tinned copper braid

MECHANICAL PERFORMANCE

- Meets USB standard
- Durability: 1,500 cycles

SPECIFICATIONS

- USB Compliant
- Product Specification: GES-12-130
- Agency Approval: UL/CSA
- Packaging Specification: GS-14-1093

ELECTRICAL PERFORMANCE

- Operating Voltage
  - USB: 5Vdc
  - +Power: 12Vdc/24Vdc
  - Withstanding voltage: 750 vac rms.
- Current rating
  - USB: 1 amp/contact
  - +Power: 3 amp/contact
  - Low level contact resistance (LLCR): 30mΩ max.
  - Signal impedance: 90Ω +/- 15%

PACKAGING

- Receptacles: tubes
- Cables: one per bag

PART NUMBERS

Description	Base Part Number PCB Receptacle	Base Part Number Mating Plug Kit
Standard A Plus Power	55917	74233
Slimline A Plus Power	57489	57496
Slimline A Plus Power - mid board mount receptacle	10011029	57496
Slimline A Plus Power - under board mount receptacle	10063583	57496

Contact your local FCI sales representative for cable assemblies

SOFIX® POWER CABLE ASSEMBLIES

Part of the Metral® Backplane Connector Family

DESCRIPTION

Higher input/output density and signal speeds demand management of EMC. The Sofix® front I/O interconnect system is comprised of right-angle headers and cable plugs that are suitable for the distribution of power and signals. Sofix connectors are fully shielded down to the PCB level to provide EMC shielding at the sub-rack/front panel level. When used with appropriate cables, the emission level from these links is well below IEC/CISPR 22 and FCC part 15 class B requirements. Sofix power connectors feature a robust design and are suitable for applications in systems with slot pitch as low as 15mm. The design rules for the Sofix family of I/O connectors are derived from the Metral system (IEC 61076-4-104). As such, the Sofix system can be used as complement to the Metral backplane connector family or applied as dedicated I/O solution.

FEATURES & BENEFITS

- Unique EMC properties
- 10 Amps per power contact
- According to IEC 60950 and UL 1950
- Hot pluggable
- Robust design
- 15mm slot pitch
- RoHS-compliant design

TARGET MARKETS / APPLICATIONS

- Communication
- Instrumentation
- Medical
- Hazardous environments

TECHNICAL INFORMATION

MATERIALS

- Plug
  - Housing: Polybutylene Terephthalate (PBT UL94 V-0)
  - Terminals: Copper Alloy
  - Covers: Zinc Alloy
- Header
  - Housing: Liquid Crystal Polymer (UL-94 V-0)
  - Terminals: Copper Alloy
  - Covers: Zinc Alloy
  - Ground Spring: Stainless Steel

APPROVAL & CERTIFICATIONS

- Underwriters Laboratories Inc. (UL file no. E66906)
- Canadian Standards Association (CSA file no. LR46923)

PERFORMANCE

- Per Telcordia GR1217-CORE, Central Office requirements

PRODUCT SPECIFICATION

- Header: GS-12-307
- Cable Connector: GS-12-308
- Recommended Cable specification:
  - Copper 2.5mm^2
  - Overall Ø 1.95mm
  - Total diameter Ø 8.0mm max.
- Packaging Specification: GS-14-1093

MECHANICAL CHARACTERISTICS

- Insertion force: 20 N max
- Durability: 200 cycles (Telcordia)
- Temperature Range: -40°C to +70°C

ELECTRICAL CHARACTERISTICS

- Current rating: 10 A per contact
- Withstanding voltage: 1000 V RMS
- Initial Insulation resistance: 5000MΩ minimum.

PACKAGING

- Headers: Tubes
- Header accessories: Bags
- Cable Connector components: Bags

PART NUMBERS

Description	Part Number
Header Right Angle with 15 Amp filter	72846-204LF
Cable connector kit	72824-201LF

Contact your local FCI sales representative for cable assemblies

For more information about e-catalog or FCI sales offices, headquarters, agents and local distributors, visit www.fciconnect.com

Americas - Phone: 1 (800) 237 2374 Europe- - Phone: 33 1 72 67 35 00 Asia/Pacific - Phone: 65 6549 6666

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