HIGH PIN COUNT (HPC) BACKPLANE CONNECTOR SYSTEM

0.100'' (2.54mm) Pitch

OVERVIEW

The HPC connector is a traditional backplane interface providing rugged mechanical and electrical performance. It enables 3 and 4 row daughter cards to the backplane interface. On board connector guiding and keying are available to control and discriminate daughter-card engagement with the backplane card slot.

The HPC connector compares with competitive High Density Interface (HDI) 4 Beam and Twin Beam Connectors (TBC). The square posts and formed signal contacts provide rugged mechanical interface and excellent electrical performance, while the receptacle contacts offer high reliability and low mating force.

Even though standard connector sizes range from 30 to 600 positions, custom configurations are also available, with signal or power contacts.

Primary markets served include Communications and Enterprise Systems, Industrial and Instrumentation, Medical Systems, Military Electronics, etc.

FEATURES	BENEFITS
• 0.025mm square posts and formed signal contacts	• Rugged mechanical interface • Excellent electrical performance
• Press-fit and solder tail options	• Design and PCB assembly flexibility
• Connector sizes range from 30 to 600 positions	• Satisfies a variety of applications
• Custom signal or power configurations	• Allows custom configurations

HIGH PIN COUNT (HPC) BACKPLANE CONNECTOR SYSTEM

TECHNICAL INFORMATION

MATERIALS

- Housings: High–Temperature Thermoplastic, UL 94–V0
- Contacts: Header: CU alloy, Receptacle: High performance CU alloy

ELECTRICAL PERFORMANCE

- Current Rating (continuous): 1A (all contacts powered); 2.25A (one contact powered)
- Electrical: Contact Resistance <20 m ohms; Insulation Resistance: ≥ 500 M ohms
- Signal Integrity: NEXT (500ps rise time; S/G=2/1); 10% Maximum

MECHANICAL PERFORMANCE

- Mating Force: <99 grams per contact
- Un–mating Force : >18 grams per contact
- Press fit Assembly: Seating force: <40 lbs/contact; Un–seating: >7.5 lbs/contact
- Vibration: MIL–STD–202F, Method 204D
- Mechanical Shock: EIA364 TP 27

SPECIFICATIONS

- As per Product Specification BUS–12–090

ENVIRONMENTAL

- Operating Temperature: –40°C to +125°C
- Thermal Shock: MIL–STD–202F, Method 107G

APPROVALS AND CERTIFICATIONS

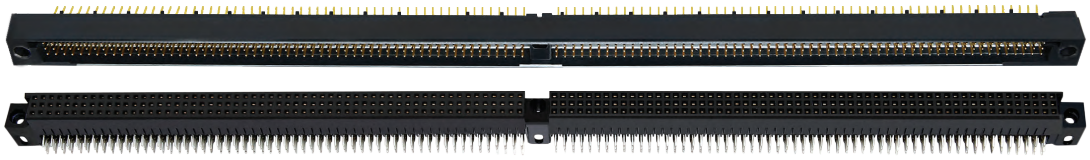
- UL94–VO: Flammability
- UL–STD–498

PACKAGING

- Tubes
- Boxes

TARGET MARKET / APPLICATIONS

- Communications and Enterprise Systems
- Industrial and Instrumentation
- Medical Systems
- Military Electronics



PART NUMBERS

Description	3 Rows 0 Guides	4 Rows 0 Guides	4 Rows 2 Guides
Range of Positions	30 to 240	40 to 320	480 to 600
Vertical Pin Header with Solder tails	50012–XYYYZ	50015–XYYYZ	
Vertical Pin Header with Press–fit tails	50006–XYYYZ	50009–XYYYZ	50011–XYYYZ
Right Angle Receptacle with Solder tails	50294–XYYYZ	50295–XYYYZ	
Right Angle Receptacle with Press–fit tails	50645–XYYYZ	50642–XYYYZ	50644–XYYYZ

NOTES

- **X**: Plating Options
  - **1** = Gold
  - **5** = GXT™
- **YYY**: Number of positions
- **Z**: Tail Length
- **LF**: Lead Free

GXT™ is an FCI Electronics patented process of palladium-nickel alloy plated with a gold flash

BPLHPCCON0115EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

INFINX™ HIGH SPEED MEZZANINE CONNECTORS

OVERVIEW

The InfinX™ high-speed mezzanine connector system is designed to meet the needs of up to 25G/bps application. The combination of multiple stack heights (10mm to 42mm) and multiple sizes (5, 9 & 15 columns utilizing 100 Ohm or 85 Ohm differential matched impedance design allows for optimal design flexibility while yielding low loss performance < 1 dB @10 GHz and very low cross talk < 40 dB up to 20 GHz for the largest single aggressor by using “Resonance Dampening” technology.

Licensed from Amphenol-TCS, intermatable, electrically and mechanically interchangeable second source to ATCS InfinX™.

FEATURES & BENEFITS

- Up to 25 Gb/s differential pair performance
- High density: 17 (4 pair) to 26 (6 pair) differential pairs per linear centimeter, or 44(4 pair) to 66 (6 pair) differential pairs per linear inch, which allow for optimization of board space and signal requirements
- Proven ball grid array (BGA) termination for process friendly attachment
- "Resonance Dampening" technology for exceptionally low crosstalk and resonances
- 1.15mm x 2.3mm BGA interface pitch optimizes routing and electrical performance.
- 85 Ohm and 100 Ohm impedance
- Offer 4 & 6 Pair modules and 5, 9,or 15 columns
- 4 pair stack heights range from 15mm to 35mm. 6 pair stack heights range from 10mm to 42m
- Can be selectively loaded with wafers optimized for high speed differential, single-ended, and power
- “Stubless” low mating force interface. No free standing pins or blades
- 2mm contact wipe
- Polarized design assures proper mating of the connector
- RoHS compliant

TARGET MARKETS / APPLICATIONS

- Communications
  - Transmission
  - Access
  - Switching
  - Optics
  - Networking
- Data
  - Servers
  - Storage
- I & I
  - Industrial controls & equipment

TECHNICAL INFORMATION

MATERIALS

- Housing: Liquid crystal polymer
- Contact: Copper alloy
- Vacuum cap: stainless steel
- Plating: Performance-based plating at separable interface, meet requirements of product specification.
- Solder spheres: Lead free. 95.5Sn/4Ag/0.5Cu

ELECTRICAL PERFORMANCE

- Current rating: 0.5A per contact with ≤30°C temperature rise.
- Contact resistance: ≤20 mΩ
- Dielectric withstanding voltage: 500VAC
- Insulation Resistance: 1000 MΩ

MECHANICAL PERFORMANCE

- In accordance with Telcordia GR-1217-CORE and EIA-364

MECHANICAL PERFORMANCE

- Durability: 25 cycles
- Mating force: 0.40 N max. per contact
- Unmating force: 0.07 N min. per contact
- Contact wipe: 2mm nominal

SPECIFICATIONS

- Product specification: GS-12-1061
- Application specification: GS-20-0365

APPROVALS AND CERTICATIONS

- UL and CSA approval pending

PACKAGING

- Hard tray

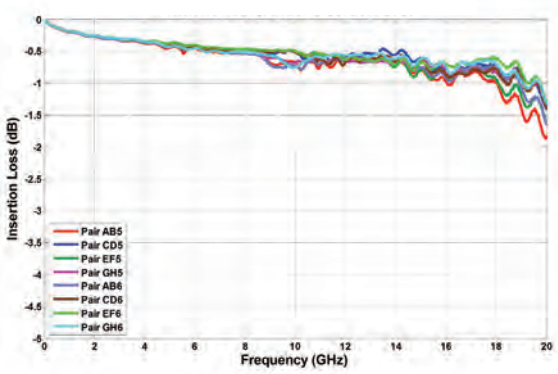
SIGNAL INTEGRITY PERFORMANCE

- Impedance: 85Ω (+/-10%)(current offering)
- Insertion loss: < 1 dB @10 GHz
- Cross talk: < 40 dB up to 20 GHz for the largest single aggressor

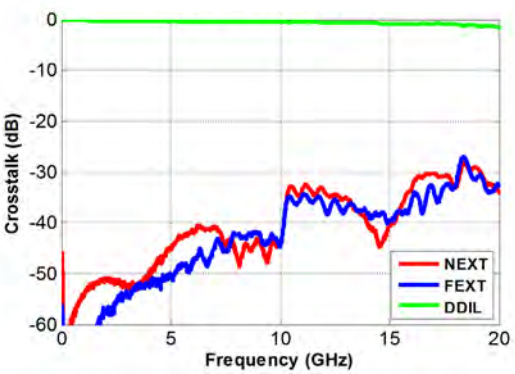
MORE DATA

- Spice files, signal integrity data, drawings and more available at: www.fci.com/Infinx or contact InfinX@fci.com

DIFFERENTIAL INSERTION LOSS



POWER-SUMMED CROSSTALK



PRODUCT STACK HEIGHT SELECTOR

STACK HEIGHT RANGE FROM 10MM TO 42MM

4 Pair			15		18.5	19.5		23			30.5		35		
6 Pair	10	12	15	17			20	23	27	28	30	32		38	42

Remark – Tooled – Under Development – Not Tooled – Not Offered

PLUG PART NUMBER SCHEME

10120260	X	X	X	X	0	X	LF

Stack Height	X
6mm	1
10.5mm	2

Number of IMLAs	X
5 IMLA s	1
9 IMLA s	2
15 IMLA s	3

Resonance Damper	X
6mm	1
10.5mm	2

Plating	X
GXT	1

Impedance	X
100 ohm	1
85 ohm	2

"LF" added for Lead-Free Products

RECEPTACLE PART NUMBER SCHEME

10120300	X	X	X	X	0	X	LF

Stack Height	X
9mm	1
24.5mm	2

Number of IMLAs	X
5 IMLA s	1
9 IMLA s	2
15 IMLA s	3

Resonance Damper	X
Without	0
With	1

Plating	X
GXT	1

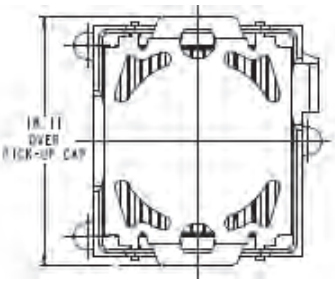
Impedance	X
100 ohm	1
85 ohm	2

"LF" added for Lead-Free Products

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

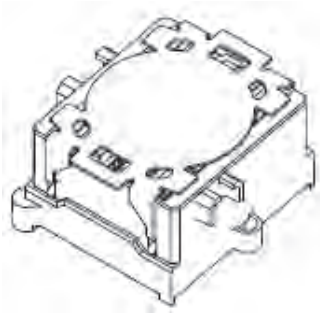
PRODUCT OFFERINGS

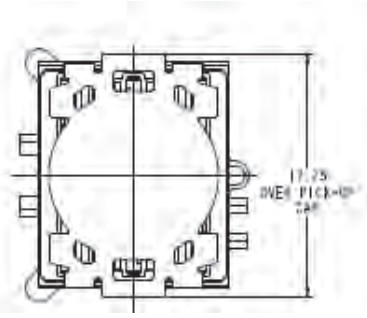
PLUG (5 COLUMN AS SHOWN)

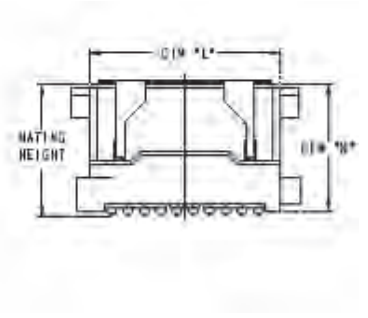


Pair Count	Gender	Column	Damper	Impe-dance	Mating Height	DIM " H"	DIM " L"	Part Numbers
4	Plug	5	Yes	85Ω	6mm	11.1mm	15.2mm	10120260-111-102LF
4	Plug	5	No	85Ω	6mm	11.1mm	15.2mm	10120260-110-102LF
4	Plug	15	Yes	85Ω	6mm	11.1mm	38.2mm	10120260-131-102LF
4	Plug	15	No	85Ω	6mm	11.1mm	38.2mm	10120260-130-102LF

RECEPTACLE (5 COLUMN AS SHOWN)







Pair Count	Gender	Col-umn	Damper	Impe-dance	Mating Height	DIM " H"	DIM " L"	Part Numbers
4	Receptacle	5	Yes	85Ω	9mm	8.9mm	13.4mm	10120300-111-102LF
4	Receptacle	5	No	85Ω	9mm	8.9mm	13.4mm	10120300-110-102LF
4	Receptacle	15	Yes	85Ω	9mm	8.9mm	36.4mm	10120300-131-102LF
4	Receptacle	15	No	85Ω	9mm	8.9mm	36.4mm	10120260-130-102LF

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For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

10GBD INDUSTRIAL TEMPERATURE SFP+ 1310NM LIMITING

OVERVIEW

FCI's TRX10GDP0311A1 Industrial Temperature SFP+ optical transceiver is designed for outdoor networking applications and other applications requiring a wide operational temperature range. The TRX10GDP0311A1 is compliant with SFP+ MSA specifications (SFF–8431, SFF–8432, SFF–8472), 10 Gigabit Ethernet specifications (10GBASE–LR/LW), and also 10G FibreChannel (1200–SM–LL–L). It is RoHS 6/6 compliant per Directive 2002/95/EC and laser class 1 safety compliant per IEC/CDRH. The sub–Watt power consumption and the excellent EMI performance allows system designs with high port density.

FEATURES & BENEFITS

- –40°C to +85°C case operating temperature range
- Compliant to SFP+ Electrical MSA SFF–8431
- Compliant to SFP+ Mechanical MSA SFF–8432
- Supports 10G Ethernet signaling protocol
- Data rate transparent from 9.95Gbps to 11.3Gbps
- Support I2C for serial transceiver ID and digital diagnostic monitoring per SFF–8472.
- Transmission distance up to 10km (SM fiber)
- Low power consumption: 0.8W (Typ.)
- Laser Class 1 IEC / CDRH compliant
- RoHS 6/6 compliant
- Compliant with product safety standards

TARGET MARKETS / APPLICATIONS

- Uncontrolled temperature environments
- Data Center
- High Performance Computing
- Switching
- Industrial

SUPPORTED STANDARDS

- 10GBASE–LR per IEEE 802.3
- 10GBASE–LW per IEEE 802.3
- 10GFC per 1200–SM–LL–L

TECHNICAL INFORMATION

MATERIALS

- Mates with:
  - Board Connector: FCI P/N 10122424 series
  - Cage: FCI P/N 10122382-101LF
  - LC interface: FCI P/N 10120511-series

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 10Gbps
- Power consumption: 0.80W (typ.)
- Transmitter type: 1310 nm DFB laser
- Receiver type: PIN-diode

ENVIRONMENTAL

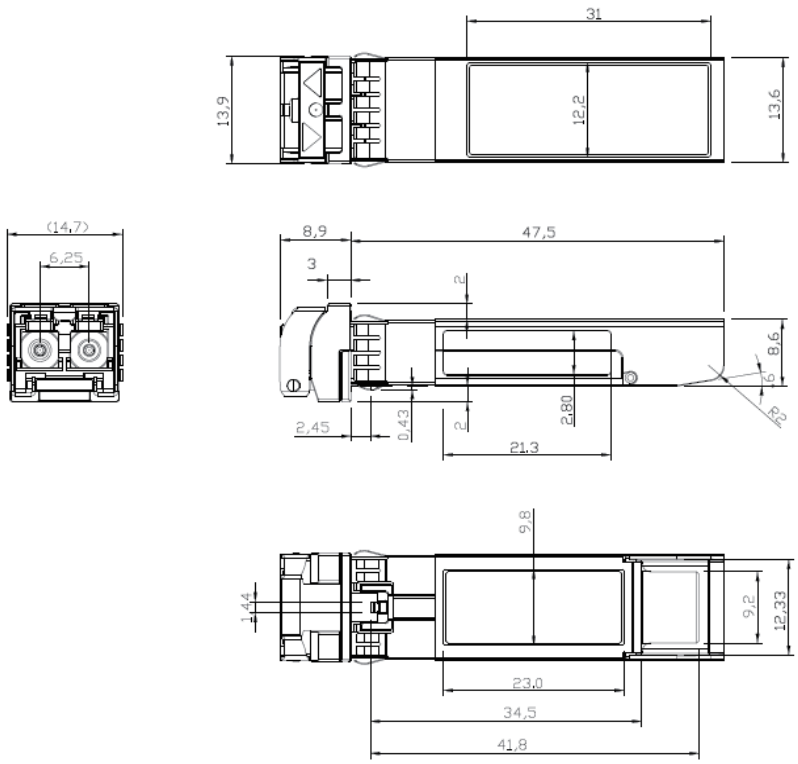
- RoHS 6/6 compliant
- Laser Class 1 / CDHR
- Operating temperature range: -40°C to +85°C
- Temperature life – EIA 364-17, Method A, Condition 3, Time Condition C, 500 hours, 85°C
- Mixed Flowing gas – EIA 364-65, Class IIA – 10 days unmated and 10 days mated (EIA-364-21)

SPECIFICATIONS

- Module meets MSA –Small Form Factors
  - SFF-8431 / Electrical
  - SFF-8432 / Mechanical
  - SFF-8472 / Diagnostic
- Product Specification: GS-12-1108

CERTIFICATIONS & APPROVAL

- TUV : EN60950-1:2001
- FDA : CDRH 21 CFR 1040.10 and 1040.11



Application	Standard	Data Rate
10G Ethernet LAN/WAN	IEEE 802.3 10GBASE-LR/LW	10.3125 / 9.953 Gbps
10G Fibre Channel	1200-SM-LL-L	10.518 Gbps

OPISFP+131003I4EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

CXP, 120 GB/S & 150 GB/S ACTIVE OPTICAL CABLE

OVERVIEW

The 120 Gb/s & 150 Gb/s CXP – CXP Active Optical Cable (AOC) are a natural choice for optical cabling in high performance/in high computational hardware applications. They provide a cost effective plug and play cabling solution. The CXP form factor delivers the highest hardware faceplace port density among existing SFF industry standards.

Optical transceivers inside both cable connectors improve both speed and distance versus traditional copper assemblies.

The assembly is a full duplex, 12 channel construction with each channel capable of transmitting data at rates up to 10 Gb/s (for 120 Gb/s aggregate bandwidth) & 12.5 Gb/s (for 150 Gb/s aggregate bandwidth).

Typical applications serve signal transmission distances between 5 and 100m.

FEATURES & BENEFITS

- Ease of installation
  - Plug and play
  - SFF–8642 compliant
  - Supports Infiniband SDR ,DDR and QDR data rates
  - Same transceiver on each end
- Straight and angled boot cable exit options
  - 100% final tested
  - Assembled under clean room environment

TARGET MARKETS / APPLICATIONS

- Data Center
- High Performance Computing
- Switching
- Industrial

TECHNICAL INFORMATION

MATERIALS

- Fiber cable:
  - Multi-mode
  - OFNP
- Mates with:
  - 84 pos CXP board connector

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 10 Gb/s (for 120 Gb/s) & 12.5 Gb/s (for 150 Gb/s)
- Power consumption: 2.2 watts (typ.)
- Transmitter type: VCSEL
- Receiver type: PIN-diode

ENVIRONMENTAL

- RoHS 6/6 compliant
- Laser Class 1 / CDRH
- Case temperature 0°C to 70°C
- Halogen free (optional)

SPECIFICATIONS

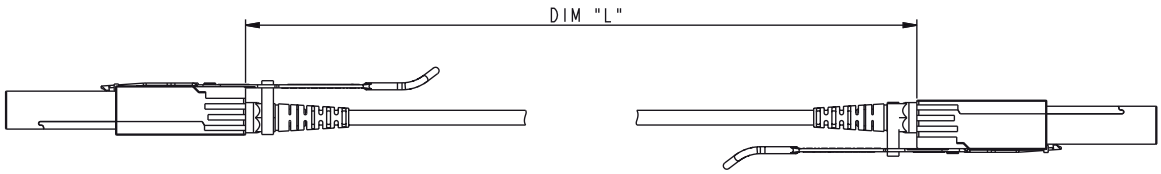
- Module meets MSA – Small Form Factor SFF-8642
- Cable assembly supports Infiniband SDR, DDR and QDR signaling protocols
- Product Specification: GS-12-0966 (for 120 Gb/s) & GS-12-1073 Gbps (for 150 Gb/s)

CERTIFICATIONS & APPROVAL

- UL : E251142-A2
- TUV : DE2-015589
- FDA : 0820640-xxx rev 004

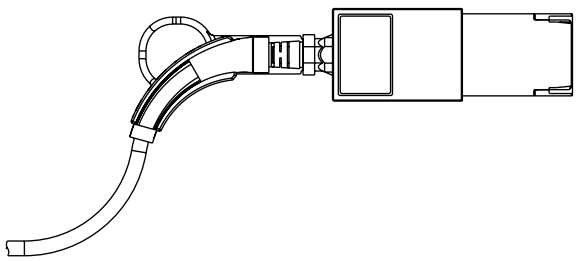
PACKAGING

- Blister reel up to 30 meter length
- Box beyond 30 meter length



PART NUMBERS

Description	Part Number
Straight exit boot	ICD120GVP2410-XX
90 degree exit boot	ICD120GVP2430-XX



Suffix XX	Cable Length (m)	Category	Colour
01	1	OM2	Orange
03	3	OM2	Orange
05	5	OM2	Orange
10	10	OM2	Orange
15	15	OM2	Orange
20	20	OM2	Orange
30	30	OM3	Aqua
50	50	OM3	Aqua
C0	100	OM3	Aqua

OPICXPAOC0813EA4

For more information,
please contact: Communications@fci.com
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12 CHANNEL PARALLEL ACTIVE OPTICAL CABLE 120 GBIT/S CXP – 3xQSFP+ AOC

OVERVIEW

FCI's 120Gb/s CXP to 3xQSFP+ Active Optical Cable (AOC) provides an interconnect solution for systems that require both CXP and QSFP+ connections. The 12-channel CXP is split into three separate 4-channel QSFP+ connections. The QSFP+ ends are all 40GbE compliant and the three 40GbE links are aggregated into one 12-Channel CXP. Individual lanes are also 10GbE compliant.

FCI's CXP – to 3 QSFP Active Optical Splitter Cable (AOC) is a high speed, high density cabling interconnect uniquely suited to address HPC and high computational system cabling applications like interconnection from an enterprise switch to network server systems. It provides an easy to use, cost effective, plug and play optical transmission based cabling solution.

The CXP & QSFP Form factors deliver the highest hardware faceplace port density as well as the highest performance interfaces among all of the SFF industry cabling interfaces.

The AOC features optical transceivers inside all cable connector ends and allows users to enable hardware connection at cables lengths well beyond those that traditional copper assemblies are able to address.

Lengths up to 100m are supported.

FEATURES & BENEFITS

- Full Duplex 12 Channel 850nm Parallel Active Optical Cable
- Supports transmission rates up to 10.3Gbit/s per channel
- CXP-based module at one end and QSFP-based modules at the other ends
- CXP interface fully compliant SFF- 8642; QSFP interfaces fully compliant to SFF- 8436
- Hot pluggable electrical interfaces
- CXP-based module supports Rx Pre-Emphasis
- EEPROM-based Serial-ID, accessible through two-wire Serial Interface
- Multi-channel 850nm VCSEL array
- Multi-channel PIN-detector array
- Helix type 24-fiber Multi-Mode Optical cable of up to 50m to allow bending in any direction
- Fire-resistant OFNP (Optical Fiber Non-Conductive Plenum) rated cable
- Low power CXP module: 2.2 Watts (typ.)
- Power class 4
- 0°C to +70°C operating case temperature
- Laser Class 1 IEC/CDRH compliant
- Superior linear signal density
- Optional straight or right angle cable exit boots for the CXP end
- Proven reliability in field installations

TARGET MARKETS / APPLICATIONS

- Data Center
- High Performance Computing
- High computational hardware applications
- Switching
- Industrial

12 CHANNEL PARALLEL ACTIVE OPTICAL CABLE 120GBIT/S CXP – 3xQSFP+ AOC

TECHNICAL INFORMATION

MATERIALS

- Mates with:
  - QSFP Board Connector: FCI P/N 10099113 series
  - Cage: FCI P/N 10099100-011LF
  - LC interface: FCI P/N 10120511 series

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 10Gbps
- Power consumption: 2.2 watts (typ.)
- Transmitter type: 850 nm VCSEL laser
- Receiver type: PIN – diode

ENVIRONMENTAL

- RoHS 6/6 compliant
- Laser Class 1 / CDRH
- Operating temperature range: 0°C to 70°C

SPECIFICATIONS

- Module meets MSA –Small Form Factors
  - SFF-8431 – Electrical
  - SFF-8432 – Mechanical
  - SFF-8472 – Diagnostic
  - SFF-8642 – CXP interface specification
  - SFF-8436 – QSFP interface specification
- Product Specification: GS-12-1108

CERTIFICATIONS & APPROVAL

- UL : E251142 – A2
- TUV : 21173399

PACKAGING

- Individual blister package

PART NUMBERS

Application	Standard	Part Number
10G Ethernet LAN/WAN	IEEE 802.3 10GBASE-LR/LW	ICD120GVP2420-xy
10G Fibre Channel	10GFC 1200-SM-LL-L	ICD120GVP2420-xy

Note: The " xy " designation is a function of the cable length required. For proper definition of the" xy " designation, please reference the product drawing which can be downloaded from the following link: http: //www.fci.com/en/products/optical-interconnect/active-optical-cables.html

OPICXP3QSFP0813EA4

For more information,
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FIBER OPTIC CABLE ASSEMBLIES & PIGTAILS

OVERVIEW

FCI provides an extensive line of high performance simplex and duplex optic fiber cable assemblies. All FCI assemblies are fully intermatable with industry standard coupling adapter products and deliver high performance & stability over a range of application conditions. Cable assemblies that are supported include industry standard connector types like SC, FC, ST, LC, MTRJ and others. All FCI Optical cable assemblies are manufactured to exceed customer satisfaction with the highest standards of quality. Every cable assembly / pigtail is 100% tested for Insertion Loss . Cables are offered with PC ,UPC and APC fiber end face geometry options and multiple fiber cable constructions.

FEATURES & BENEFITS

- Standard or custom configurations
- Multimode and single mode cable options
- 100% factory tested and inspected
- Offered in multiple fiber & jacket types
- PC, UPC, and APC end face geometry options

TARGET MARKETS / APPLICATIONS

- Telecommunication Networks
- Fiber to the Home (FTTH)
- CATV Networks
- Passive Optical Networks
- Local Area Networks
- Data Processing Networks
- Device Terminations
- Premises Distribution

SPECIFICATIONS

Parameters	FC,SC,LC,ST					MTRJ
	PC		UPC		APC	PC
Mode	SM	MM	SM	MM	SM	MM
Insertion loss(dB)	⩽0.3	⩽0.5	⩽0.3	⩽0.5	⩽0.3	⩽0.5
Return loss(dB)	⩾45	–	⩾50	–	⩾60	–
Repeatability(dB)	⩽0.2					
Operating Temp(℃)	-20 to 70 ℃					

SM:Single Mode MM:Multi Mode

* We also support Custom Specifications with 100% Geometry Parameters

PART NUMBERS

F	S1	SX	1	1	P	5	2	01	M	LF

FIBER OPTIC

LEAD FREE

LENGTH(UNIT)	
C	Centimeter
M	Meter

CABLE LENGTH(M) STEP SIZE 1M	CABLE LENGTH(CM) STEP SIZE 10CM
01 to 99	20 to 90

FIBER TYPE	
S1	Single mode(G652D)
S2	Single mode(G657A)
S3	Single mode(G655)
M1	Multimode(OM1)
M2	Multimode(OM2)
M3	Multimode(OM3)
M4	Multimode(OM4)

END1 END2

CONNECTOR TYPE	
0	No Connector
1	FC
2	SC
3	MTRJ Female
4	ST
5	SMA
6	MU
7	LC
8	MTRJ Male
9	E2000

JACKET MATERIAL	
1	PVC
2	OFNR
3	OFNP
4	LSZH
5	UL OFNR
6	UL OFNR
7	Custom

BOOT SIZE	
1	0.9mm Buffer
2	1.6mm Cable
3	1.8mm Cable
4	2mm Cable
5	3mm Cable

POLISH TYPE	
P	PC Finish
U	UPC Finish
A	APC Finish
H	Hybrid

FIBER TYPE	
SX	Simplex
DF	Duplex(Flat)
DZ	Duplex(Zip cord)
DR	Duplex(Round)

OPIFOCABASY0713EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

MINI–SAS HD ACTIVE OPTICAL CABLE (AOC) ASSEMBLY

OVERVIEW

FCI's Mini–SAS HD Active Optical Cable is the first active optical cable (AOC) in the market that is fully compliant to SAS 2.1 and SAS 3.0 industry standards as well as the SFF –8643 interface standard. Used primarily for external Enterprise storage applications – box–to–box, server to storage , server to switch – this cable is part of FCI's comprehensive mini–SAS HD product offerings that address all board connector and cabling applications – from 0.5 to 100 meters. This wide offering gives system architects full flexibility and a complete range of products to meet all high speed storage and high density IO system needs.

This 4 channel AOC features low power (800 milliwatts – typical) optical components , plug and play operation, and seamless backwards compatibility between the SAS 2.1 (6Gb/s) legacy equipment and SAS 3.0 (12Gb/s) next generation equipment. The managed interface includes connection discovery functionality, I2C bus communication, and the capability to customize labeling and EEPROM memory map extensions.

A small 3.0 mm diameter helix based 8 fiber cable construction allows the cable to be routed in any direction required without concern of signal loss. The cable exit at the back of the connector end can be either a straight cable exit or a 90 degree cable exit using a fiber optic boot. The cable end features a rugged die cast body and latching system to assure product reliability and retention.

PCI Express Gen3 (8Gb/s) applications are also possible with FCI's mini–SAS HD AOC when used in conjunction with PLX Technology's PCIe switches.

FEATURES & BENEFITS

- Optical connectivity enables much longer connections than copper – up to 100m
- Full SAS 3.0 compatibility ensures plug and play operation
- Supports four SAS channels per connection for efficient installations
- Low power consumption – 800 mWatts (typical)
- Twice as dense as Legacy Mini–SAS systems
- Backwards compatible one generation for interoperability with SAS 2.1 equipment. Hybrid connections are possible between SAS 3.0 and SAS 2.1 at 6 Gb/s speeds.
- Managed interface allows for connection discovery, cable management, and improved serviceability
- Fiber optic connectivity enables box–box, server–storage, server to switch configurations not possible with copper cabling
- Links up to 100m allow for more flexible installation and build–out options;
- Data is securely transferred with no potential for eavesdropping and storage can even be protected in a safe.
- The multi–fiber cable features a round jacket and loose fibers to allow for easy cable routing in any direction
- Narrow 3.0 mm cable jacket improves airflow versus bulky copper cables
- Boots can accommodate right–angle cable exit for additional flexibility in tight cabinets
- Part of FCI's complete Mini–SAS HD IO Catalog including board connectors, cages, copper and optical based cable assemblies
- OEM Label/EEPROM customizations available

TARGET MARKETS / APPLICATIONS

- Enterprise Storage
- SAS 3.0 (12 Gb/s) and SAS 2.1 (6 Gb/s)
- External Storage Connections

TECHNICAL INFORMATION

MATERIALS

- Fiber cable:
  - Helix based 8 fiber Multi-mode cable
  - OFNP (Optical Fiber Non-conductive Plenum)
  - LSZH (Low Smoke Zero Halogen)
- Die cast covers: Zinc with nickel plating
- Metal latch: Stainless steel

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 12 Gb/s
- Power consumption: 0.75 W (typ.) per end
- Transmitter type: VCSEL
- Receiver type: PIN-diode

ENVIRONMENTAL

- Conforms to RoHs requirements per EU directive 2002/95/EC
- Laser Class 1
- Halogen free（LSZH cable used）
- Operating temperature range: 0°C to 70°C

MECHANICAL PERFORMANCE

- SAS 2.1 and SAS 3.0 compliant (6G & 12G signal speeds)

SPECIFICATIONS

- SFF- 8449: Shielded Cables Management Interface for SAS
- SFF- 8636: Common Management Interface
- SFF-8644: Mini-Multilane Shielded Integrated High Density Connector
- GS-12-1122: Mini-SAS HD Active Optical Cable (AOC) product specification

CERTIFICATIONS & APPROVAL

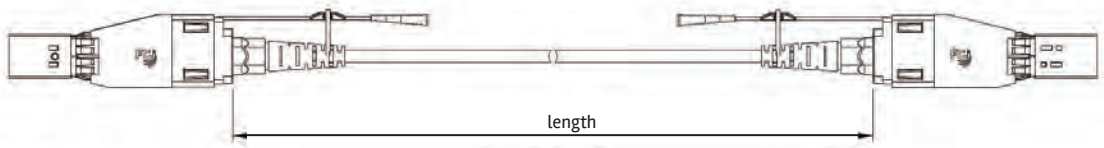
- UL: E251142-42
- TW: DE2-015589
- FDA: Accession number 0312716-411

PACKAGING

- High shield ESD bubbly wrap bag

OPTICAL MODE

- SAS2.1 and SAS 3.0 compliant in optical mode capable systems



PART NUMBERS CODING SCHEME

10123196	-	S	V	W	X	YYY

- 10123196: Mini-SAS HD AOC
- S: Fiber Type
  - 2 for OM 2 fiber (used for cable length ≤20 m)
  - 3 for OM 3 fiber (used for cable length >20m)
- V: Reserved
- W: Boot
  - O=Straight boot exit
  - I=Right angle boot exit
- X: Fiber Cable Jacket
  - L=Low Smoke Zero Halogen
  - S=OFNP
- YYY: Cable length in m (reference to right table)

Suffix YYY	Cable length(m)	Category	Colour
001	1	OM2	Orange
003	3	OM2	Orange
005	5	OM2	Orange
010	10	OM2	Orange
015	15	OM2	Orange
020	20	OM2	Orange
030	30	OM3	Aqua
050	50	OM3	Aqua
100	100	OM3	Aqua

0PIMSHDAOC0114EA4

For more information,
please contact: Communications@fci.com
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QSFP+ , 56 GB/S, ACTIVE OPTICAL CABLE

OVERVIEW

The FCI QSFP+ FDR, 56 Gb/s, Active Optical Cable series provides an optical transmission based cost effective, high performance, plug & play interconnect solution. The AOC features optical transceivers inside both cable connectors enabling improved performance and distance capability versus traditional copper assemblies.

The transceivers at both ends assure proper interoperability and provide excellent link performance. The assembly is a full duplex, 4 channel construction with each channel capable of transmitting data at rates up to 14 Gb/s. Typical applications serve signal transmission distances between 3m and 100m.

FEATURES & BENEFITS

- Full Duplex 4 Channel 850nm Parallel Active Optical Cable
- Supports transmission rates up to 14 Gbit/s per channel
- QSFP-based modules at each cable end
- QSFP interfaces fully compliant to SFF- 8436
- Hot pluggable electrical interfaces
- QSFP-based module supports Rx Pre-Emphasis
- EEPROM-based Serial-ID, accessible through two-wire Serial Interface
- Multi-channel 850nm VCSEL array
- Multi-channel PIN-detector array
- Helix type 8-fiber Multi-Mode Optical cable that allows for bending in any direction
- Fire-resistant OFNP (optical Fiber Non-Conductive Plenum) rated cable
- Low power QSFP module: 0.8 Watts (typ.) per end
- Power class 4
- 0°C to +70°C operating case temperature
- Laser Class 1 IEC/CDRH compliant

TARGET MARKETS / APPLICATIONS

- Data Center
- High Performance Computing
- Switching
- Industrial

TECHNICAL INFORMATION

MATERIALS

- Fiber cable:
  - Helix based 8 fiber Multi-mode cable
  - OFNP (Optical Fiber Non-conductive Plenum)

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 14 Gb/s
- Power consumption: 0.8W (typ.) per end
- Transmitter type: VCSEL
- Receiver type: PIN-diode

ENVIRONMENTAL

- RoHS 6/6 compliant
- Laser Class 1 / CDRH
- Operating temperature range: 0°C to 70°C
- Halogen free (optional)

SPECIFICATIONS

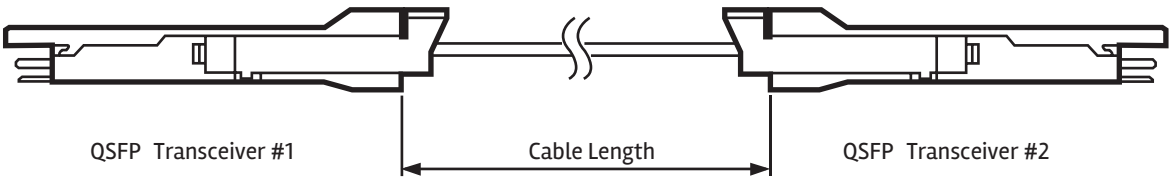
- Module meets MSA –Small Form Factors SFF- 8436 (QSFP)
- Cable assembly supports Infiniband SDR, DDR, QDR and FDR data rates
- Product Specification: GS-12-1059

CERTIFICATIONS & APPROVAL

- UL : E251142-A2
- TUV : DE2-015589
- FDA : 0820640-xxx

PACKAGING

- Blister reel up to 30 meter length
- Box beyond 30 meter length



PART NUMBERS

Description	Part Number
Straight exit boot	ICD056GVP163D-XX

Suffix XX	Cable Length (m)	Category	Colour
01	1	OM2	Orange
05	5	OM2	Orange
10	10	OM2	Orange
15	15	OM2	Orange
20	20	OM2	Orange
30	30	OM3	Aqua
50	50	OM3	Aqua
C0	100	OM3	Aqua

OPISFP+56G0813EA4

For more information,
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QSFP+ , 40 GB/S, ACTIVE OPTICAL CABLE

OVERVIEW

The FCI QSFP+ QDR, 40 Gb/s, Active Optical Cable series provides an optical transmission based cost effective, high performance, plug & play interconnect solution. The AOC features optical transceivers inside both cable connectors enabling improved performance and distance capability versus traditional copper assemblies.

The transceivers assure proper interoperability and provide excellent link performance. The assembly is a full duplex, 4 channel construction with each channel capable of transmitting data at rates up to 10 Gb/s. Typical applications serve signal transmission distances between 3m and 100m.

FEATURES & BENEFITS

- Full Duplex 4 Channel 850nm Parallel Active Optical Cable
- Supports transmission rates up to 10.3 Gbit/s per channel
- QSFP–based modules at each cable end
- QSFP interfaces fully compliant to SFF– 8436
- Hot pluggable electrical interfaces
- QSFP–based module supports Rx Pre–Emphasis
- EEPROM–based Serial–ID, accessible through two–wire Serial Interface
- Multi–channel 850nm VCSEL array
- Multi–channel PIN–detector array
- Helix type 8–fiber Multi–Mode Optical cable that allows for bending in any direction
- Fire–resistant OFNP (optical Fiber Non–Conductive Plenum) rated cable
- Low power QSFP module: 0.8 Watts (typ.) per end
- Power class 4
- 0°C to +70°C operating case temperature
- Laser Class 1 IEC/CDRH compliant

TARGET MARKETS / APPLICATIONS

- Data Center
- High Performance Computing
- Switching
- Industrial

TECHNICAL INFORMATION

MATERIALS

- Fiber cable:
  - Helix based 8 fiber Multi-mode cable
  - OFNP (Optical Fiber Non-conductive Plenum)

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 10 Gb/s
- Power consumption: 0.8 watts (typ.) per end
- Transmitter type: VCSEL
- Receiver type: PIN-diode

ENVIRONMENTAL

- RoHS 6/6 compliant
- Laser Class 1 / CDRH
- Operating temperature range: 0°C to 70°C
- Halogene free (optional)

SPECIFICATIONS

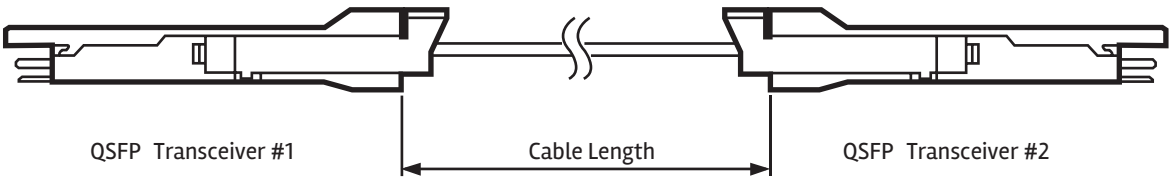
- Module meets MSA –Small Form Factors SFF- 8436 (QSFP)
- Cable assembly supports Infiniband SDR, DDR and QDR data rates
- Product Specification: GS-12-1065

CERTIFICATIONS & APPROVAL

- UL : E251142-A2
- TUV : DE2-015589
- FDA : 0820640-xxx

PACKAGING

- Blister reel up to 30 meter length
- Box beyond 30 meter length



PART NUMBERS

Description	Part Number
Straight exit boot	ICD040GVP163D-XX

Suffix XX	Cable Length (m)	Category	Colour
01	1	OM2	Orange
05	5	OM2	Orange
10	10	OM2	Orange
15	15	OM2	Orange
20	20	OM2	Orange
30	30	OM3	Aqua
50	50	OM3	Aqua
C0	100	OM3	Aqua

OPISFP+40G0813EA4

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PRODUCT SPECIFICATION MULTI–RATE 2G/4G/8G/10G FC & 10G ETHERNET SCFF 850NM LIMITING TRANSCEIVER

OVERVIEW

FCI's SCFF optical transceivers TRX08GVP2540 for 2G/4G/8G FibreChannel applications & TRX10GVP2040 for 10G–Ethernet and Fibre Channel applications are built to a small cubic form factor (SCFF) that maintains compliance to the SFF–8431 interface standard while requiring 40% less PCB real estate vs. standard SFP+ transceiver systems. Its 11pin electrical
connector supplies the electrical connection and a robust EMI cage encapsulates the entire assembly in order to assure proper EMI shielding compliance.

The assembly includes a 2 wire serial interface similar to I2C interface and power supply. It is RoHS 6/6 complaint per Directive 2002/95/EC and laser safety class 1 compliant per IEC/CDRH. The sub watt power consumption and the compact size enables hardware system designs with high port density.

FEATURES & BENEFITS

- Small Cubic Form Factor (SCFF) – 40% less PCB space needed vs. standard SFP+ systems
- 11pin electrical interface
- Complies with 2G/4G/8G/10G FC & 10G Ethernet
- Digital diagnostic through 2 wire serial interface (SFP+ compatible)
- SFP+ compatible SFI high speed electrical interface
- Low power consumption at <0.5W (typ.)
- Transmission of up to 300m over OM3 MMF
- 0°C to +70°C case operating temperature range
- 850nm VCSEL laser
- Duplex LC connector
- SCFF is UL certified for use in Low Power Systems (LPS)
- Laser safety class 1
- RoHS 6/6 compliant

TARGET MARKETS/APPLICATIONS

- Data Center
- Switching
- Industrial

PRODUCT SPECIFICATION MULTI–RATE 2G/4G/8G/10G FC & 10G ETHERNET SCFF 850NM LIMITING TRANSCEIVER

TECHNICAL INFORMATION

MATERIALS

- Cage
  FCI P/N:
  · Top: CTSCFF0802
  · Bottom: CBSCFF0802
  · Sn/Ni plated sheet bronze

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 2,4,8 & 10Gbps
- Power consumption: <0.5W (typ.)

ENVIRONMENTAL

- RoHS 6/6 compliant
- Laser class 1/CDRH
- Operating temperature range: 0°C to 70°C

SPECIFICATIONS

- Module meets MSA – Small Form Factors
- SFF – 8431/Electrical
- SFF – 8472/Diagnostic
- Product specification:
  · GS–12–0976 (TRX08GVP2540)
  · GS–12–1086 (TRX10GVP2040)

APPROVALS AND CERTIFICATIONS

- UL: E251142 – A1
- TUV: 21137374
- FDA: 0312716

PACKAGING

- Blister package (10pcs)

SUPPORTED STANDARDS

- 8G Fibre Channel
- 4G Fibre Channel
- 2G Fibre Channel
- 10G Ethernet & 10G Fibre Channel

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For more information,
please contact: Communications@fci.com
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10GB ETHERNET SFP+ LR OPTICAL TRANSCEIVER

OVERVIEW

FCI's TRX10GDP0310C1 10Gb/s Ethernet 1310nm Single Mode SFP+ LR Optical Transceiver is designed for 10km datacenter networking links.

The TRX10GDP0310C1 is compliant with SFP+ MSA specifications (SFF-8431, SFF-8432, SFF-8472), 10 Gigabit Ethernet specifications (10GBASE-LR/LW), and also 10G Fibre Channel (1200-SM-LL-L). It is RoHS 6/6 compliant per Directive 2002/95/EC and laser class 1 safety compliant per IEC/CDRH.

Today's datacenters are larger than ever and the 10km reach of the TRX10GDP0310C1 is more than sufficient to make these connections.

FEATURES

- Supports Commercial Temperature Range
- Ethernet 10GBASE-LR/LW Compliance
- Fibre Channel 1200-SM-LL-L Compliance
- SFF-8431 SFP+ Electrical MSA Compliance
- SFF-8436 SFP+ Mechanical MSA Compliance
- SFF-8472 SFP+ Diagnostic Interface MSA Compliance
- Data rate transparent from 9.95Gb/s to 11.3Gb/s
- Low Power Consumption

BENEFITS

- Operates over temperature range of 0°C to +70°C (case)
- Ethernet Transmission distance up to 10km (single mode fiber)
- Interoperable with other 10GBASE-LR/LW compatible transceivers
- Fibre Channel Transmission distance up to 10km (single mode fiber)
- Electrically interoperable with all SFP+ ports
- Mechanically interoperable with all SFP+ ports
- Supports duplex LC optical connectors
- Allows for connection discovery and signal condition monitoring
- Supports Non-standard protocols in this range of data rates
- Only 0.75W (Typ.) power consumption

TECHNICAL INFORMATION

MATERIALS

- Mates with:
  - Board Connector: 10122424-1012F
  - Cage:
    - 1x1 cage configuration- FCI P/N 10122382, 10126907 & 10126908 series
    - 1x2 cage configuration- FCI P/N 10127103 & 10127105 series
    - 1x4 cage configuration- FCI P/N 10122388, 10126909 & 10126910 series
  - LC interface: FCI P/N 10120511-series

ELECTRICAL PERFORMANCE

- Power Supply Voltage: 3.3V
- Data Rate per Lane: 10 Gbps
- Power Consumption: 0.75 (typ.)
- Transmitter Type: 1310 nm DFB laser
- Receiver Type: PIN-diode

ENVIRONMENTAL

- RoHS 6/6 Compliant
- Laser Class 1/ CDHR
- Operating Temperature Range: 0°C to 70°C

SPECIFICATIONS

- Module meets MSA- Small Form Factor
  - SFF-8431/ Electrical
  - SFF-8432/ Mechanical
  - SFF-8472/ Diagnostic
- Product Specification: GS-12-0974

APPROVALS AND CERTIFICATIONS

- TUV: 2113137-019
- UL: E251142-191
- FDA: 0312716

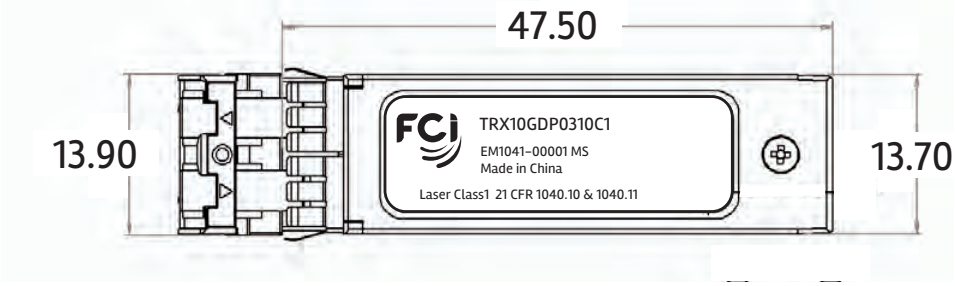
PACKAGING

- Individual Blister Package

TARGET MARKET/ APPLICATIONS

- Communications
  - Switches
- Data
  - Data Center
  - High Performance Computing
- Industrial & Instrumentation

PART NUMBERS



Application	Standard	Part Number
10G Ethernet LAN/WAN	IEEE 802.3 10GBASE – LR/LM	TRX10GDP0310C1

OPISFP+LROT0714EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

SFP+, 10G ETHERNET, LRM OPTICAL TRANSCEIVER

OVERVIEW

FCI SFP+ LRM (Long Reach Multimode) Optical Transceivers are compliant with Small Form Factor standards providing a cost effective, high performance, plug and play solution. The module is electrically pluggable to standardized SFP+ board connectors and EMI cages as well as optically pluggable to duplex LC optical interconnection.

The assembly is a full duplex, single channel construction capable of transmitting data at rates up to 10 Gb/s. Typical applications are serving signal transmission up to 220 meters.

FEATURES & BENEFITS

- Compliant to SFP+ Electrical MSA SFF–8431
- Compliant to SFP+ Mechanical MSA SFF–8432
- Supports 10G Ethernet signaling protocol
- Data rate transparent from 9.95Gbps to 11.3Gbps
- Support I2C for serial transceiver ID and digital diagnostic monitoring per SFF–8472
- Transmission distance up to 220m (OM3 fiber)
- Low power consumption: 0.8W (Typ.)
- 0°C to +70°C case operating temperature range
- Laser Class 1 IEC / CDRH compliant
- RoHS 6/6 compliant
- Compliant with product safety standards

TARGET MARKETS / APPLICATIONS

- Data Center
- High Performance Computing
- Switching
- Industrial

TECHNICAL INFORMATION

MATERIALS

- Mates with:
  - Board Connector: FCI P/N 10122424 series
  - Cage: FCI P/N 10122382-101LF
  - LC interface: FCI P/N 10120511 series

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 10Gbps
- Power consumption: 0.55W (typ.)
- Transmitter type: 850 nm VCSEL laser
- Receiver type: PIN-diode

ENVIRONMENTAL

- RoHS 6/6 compliant
- Laser Class 1 / CDRH
- Operating temperature range: 0°C to 70°C

SPECIFICATIONS

- Module meets MSA –Small Form Factors
  - SFF-8431 / Electrical
  - SFF-8432 / Mechanical
  - SFF-8472 / Diagnostic
- Product Specification: GS-12-0984

CERTIFICATIONS & APPROVAL

- UL : E251142-191
- TUV : 2113137-019
- FDA : 0312716

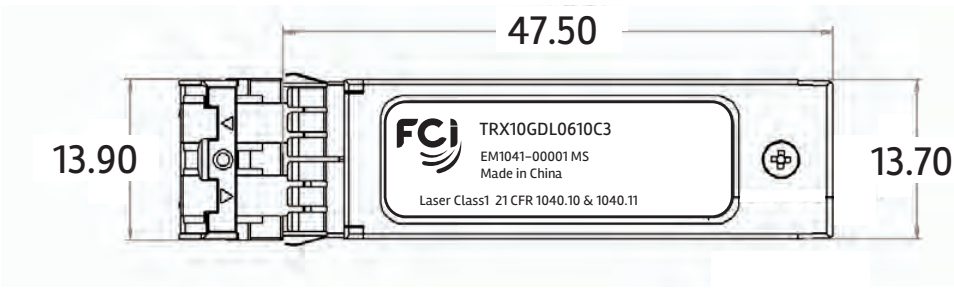
PACKAGING

- Individual blister package

SUPPORTED STANDARDS

- 10GBASE-LRM per IEEE 802.3

PART NUMBERS



Application	Standard	Part Number
10G Ethernet	IEEE 802.3 10GBASE-LRM	TRX10GDL0610C3

OPISFP+LRM0314EA4

For more information,
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or visit us at www.fci.com

SFP+, 10G ETHERNET, SR OPTICAL TRANSCEIVER

OVERVIEW

FCI's SFP+ SR (Short Reach) Optical Transceivers are fully compliant with all applicable Small Form Factor standards (including SFF–8431) and provides a cost effective, high performance, plug and play interconnect solution for Datacom and Telecom networking solutions.

The module is electrically pluggable to standardized SFP+ board connectors and EMI cages as well as optically pluggable to duplex LC optical interconnection.

The assembly is a full duplex, single channel construction capable of transmitting data at rates up to 10 Gb/s. Typical applications are serve signal transmission distances up to 300m on OM3 MMF.

FEATURES & BENEFITS

- Hot pluggable SFP+ optical transceiver
- 10G Ethernet
- Data rate transparent from 9.95Gbps to 11.3Gbps
- Low power consumption, <0.6W typ
- Excellent EMI performance
- Transmission distance up to 300m OM3 MMF
- Fully compliant to SFF– 8431, 8432 and 8472 industry standards
- 0°C to +70°C case operating temperature
- 850nm VCSEL laser
- Duplex LC connector
- Laser Class 1 IEC/CDRH Compliant
- RoHS 6/6 compliant

TARGET MARKETS / APPLICATIONS

- Data Center
- High Performance Computing
- Switching
- Industrial

TECHNICAL INFORMATION

MATERIALS

- Mates with:
  - Board Connector: FCI P/N 10122424 series
  - Cage: FCI P/N 10122382-101LF
  - LC interface: FCI P/N 10120511 series

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 10Gbps
- Power consumption: 0.55W (typ.)
- Transmitter type: 850 nm VCSEL laser
- Receiver type: PIN-diode

ENVIRONMENTAL

- RoHS 6/6 compliant
- Laser Class 1 / CDRH
- Operating temperature range: 0°C to 70°C

SPECIFICATIONS

- Module meets MSA –Small Form Factors
  - SFF-8431 / Electrical
  - SFF-8432 / Mechanical
  - SFF-8472 / Diagnostic
- Product Specification: GS-12-0903

CERTIFICATIONS & APPROVAL

- UL : E251142-191
- TUV : 2113137-019
- FDA : 0312716

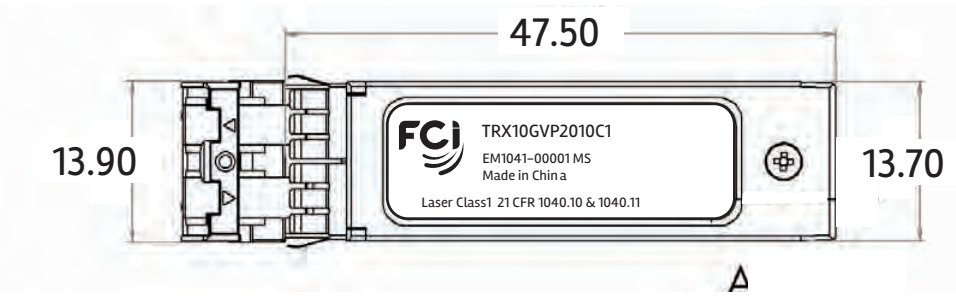
PACKAGING

- Individual blister package

SUPPORTED STANDARDS

- 10GBASE-SR per IEEE 802.3
- 10GBASE-SW per IEEE 802.3

PART NUMBERS



Application	Standard	Part Number
10G Ethernet LAN	IEEE 802.3ae 10GBASE-SR	TRX10GVP2010C1
10G Ethernet WAN	IEEE 802.3ae 10GBASE-SW	TRX10GVP2010C1

OPISFP+SROT0314EA4

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SFP+, 10G ETHERNET, LRM OPTICAL TRANSCEIVER

OVERVIEW

FCI SFP+ LRM (Long Reach Multimode) Optical Transceivers are compliant with Small Form Factor standards providing a cost effective, high performance, plug and play solution. The module is electrically pluggable to standardized SFP+ board connectors and EMI cages as well as optically pluggable to duplex LC optical interconnection.

The assembly is a full duplex, single channel construction capable of transmitting data at rates up to 10 Gb/s. Typical applications are serving signal transmission up to 220 meters.

FEATURES & BENEFITS

- Compliant to SFP+ Electrical MSA SFF–8431
- Compliant to SFP+ Mechanical MSA SFF–8432
- Supports 10G Ethernet signaling protocol
- Data rate transparent from 9.95Gbps to 11.3Gbps
- Support I2C for serial transceiver ID and digital diagnostic monitoring per SFF–8472
- Transmission distance up to 220m (OM3 fiber)
- Low power consumption: 0.8W (Typ.)
- 0°C to +70°C case operating temperature range
- Laser Class 1 IEC / CDRH compliant
- RoHS 6/6 compliant
- Compliant with product safety standards

TARGET MARKETS / APPLICATIONS

- Data Center
- High Performance Computing
- Switching
- Industrial

TECHNICAL INFORMATION

MATERIALS

- Mates with:
  - Board Connector: FCI P/N 10122424 series
  - Cage: FCI P/N 10122382-101LF
  - LC interface: FCI P/N 10120511 series

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 10Gbps
- Power consumption: 0.55W (typ.)
- Transmitter type: 850 nm VCSEL laser
- Receiver type: PIN-diode

ENVIRONMENTAL

- RoHS 6/6 compliant
- Laser Class 1 / CDRH
- Operating temperature range: 0°C to 70°C

SPECIFICATIONS

- Module meets MSA –Small Form Factors
  - SFF-8431 / Electrical
  - SFF-8432 / Mechanical
  - SFF-8472 / Diagnostic
- Product Specification: GS-12-0984

CERTIFICATIONS & APPROVAL

- UL : E251142-191
- TUV : 2113137-019
- FDA : 0312716

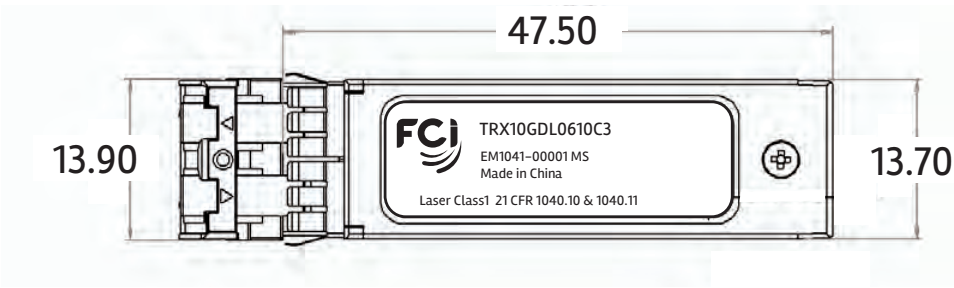
PACKAGING

- Individual blister package

SUPPORTED STANDARDS

- 10GBASE-LRM per IEEE 802.3

PART NUMBERS



Application	Standard	Part Number
10G Ethernet	IEEE 802.3 10GBASE-LRM	TRX10GDL0610C3

OPISFP+LRM0314EA4

For more information,
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10GBD INDUSTRIAL TEMPERATURE SFP+ 1310NM LIMITING

OVERVIEW

FCI's TRX10GDP0311A1 Industrial Temperature SFP+ optical transceiver is designed for outdoor networking applications and other applications requiring a wide operational temperature range. The TRX10GDP0311A1 is compliant with SFP+ MSA specifications (SFF–8431, SFF–8432, SFF–8472), 10 Gigabit Ethernet specifications (10GBASE–LR/LW), and also 10G FibreChannel (1200–SM–LL–L). It is RoHS 6/6 compliant per Directive 2002/95/EC and laser class 1 safety compliant per IEC/CDRH. The sub–Watt power consumption and the excellent EMI performance allows system designs with high port density.

FEATURES & BENEFITS

- –40°C to +85°C case operating temperature range
- Compliant to SFP+ Electrical MSA SFF–8431
- Compliant to SFP+ Mechanical MSA SFF–8432
- Supports 10G Ethernet signaling protocol
- Data rate transparent from 9.95Gbps to 11.3Gbps
- Support I2C for serial transceiver ID and digital diagnostic monitoring per SFF–8472.
- Transmission distance up to 10km (SM fiber)
- Low power consumption: 0.8W (Typ.)
- Laser Class 1 IEC / CDRH compliant
- RoHS 6/6 compliant
- Compliant with product safety standards

TARGET MARKETS / APPLICATIONS

- Uncontrolled temperature environments
- Data Center
- High Performance Computing
- Switching
- Industrial

SUPPORTED STANDARDS

- 10GBASE–LR per IEEE 802.3
- 10GBASE–LW per IEEE 802.3
- 10GFC per 1200–SM–LL–L

TECHNICAL INFORMATION

MATERIALS

- Mates with:
  - Board Connector: FCI P/N 10122424 series
  - Cage: FCI P/N 10122382-101LF
  - LC interface: FCI P/N 10120511-series

ELECTRICAL PERFORMANCE

- Power supply voltage: 3.3V
- Data rate per lane: 10Gbps
- Power consumption: 0.80W (typ.)
- Transmitter type: 1310 nm DFB laser
- Receiver type: PIN-diode

ENVIRONMENTAL

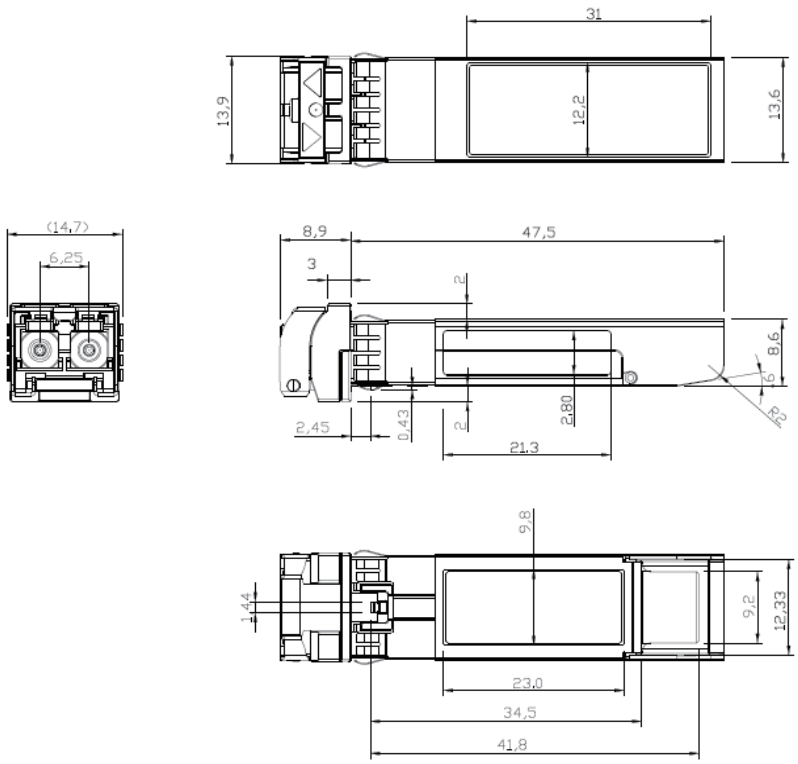
- RoHS 6/6 compliant
- Laser Class 1 / CDHR
- Operating temperature range: -40°C to +85°C
- Temperature life – EIA 364-17, Method A, Condition 3, Time Condition C, 500 hours, 85°C
- Mixed Flowing gas – EIA 364-65, Class IIA – 10 days unmated and 10 days mated (EIA-364-21)

SPECIFICATIONS

- Module meets MSA –Small Form Factors
  - SFF-8431 / Electrical
  - SFF-8432 / Mechanical
  - SFF-8472 / Diagnostic
- Product Specification: GS-12-1108

CERTIFICATIONS & APPROVAL

- TUV : EN60950-1:2001
- FDA : CDRH 21 CFR 1040.10 and 1040.11



Application	Standard	Data Rate
10G Ethernet LAN/WAN	IEEE 802.3 10GBASE-LR/LW	10.3125 / 9.953 Gbps
10G Fibre Channel	1200-SM-LL-L	10.518 Gbps

OPISFP+131003I4EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

HCI® HIGH POWER BACKPLANE / MIDPLANE CONNECTORS

OVERVIEW

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-andformed 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 113A 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 touchproof 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. A 2x2 right-angle receptacle extends use to co-planar applications when used with a 1x2 or 2x2 right-angle header.

FEATURES & BENEFITS

- Current rating to 113A/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
- Protected backplane/midplane receptacle is UL 60950 compliant (Test Finger & Test Probe)
- Press-fit termination is available for thicker, higher-layercount boards
- Compatible with lead-free processing temperatures

TARGET MARKETS / APPLICATIONS

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

TECHNICAL INFORMATION

MATERIALS

- Housing: High-temperature thermoplastic (UL 94V-0), black
- Contact base metal: High-conductivity copper alloy
- Contact Finish
  - Separable interface: Performance-based plating over nickel (per the GS-12-380 product specification)
- Termination area: Matte tin over nickel

ELECTRICAL PERFORMANCE

- Current rating: (≤30°C T-rise above ambient in still air)
  - 83A/contact max. for a 2 position module
  - 75A/contact max. for a 3 position module
- Operating voltage: 300V
- Dielectric withstanding voltage: 2500V
- Insulation resistance: >10,000MΩ minimum
- Contact Resistance: ≤0.5mΩ initially and after environmental exposure

MECHANICAL PERFORMANCE

- Durability: 200 cycles

SPECIFICATIONS

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

APPROVALS AND CERTIFICATIONS

- UL – 95A per contact in still air
- CSA
- TUV
- UL 60950 compliant (Test Finger & Test Probe)
- Telcordia GR-1217-CORE, Central Office

PACKAGING

- Tubes

PART NUMBERS

Minimum Card Slot Spacing (mm)	Contacts		Current Rating		Number Of Columns	Column pitch (mm)	Module Width Along Card Edge (mm)	With Molded Center Guide	Power Module Part Numbers	
									Backplane/Midplane	Daughter Card
	Total	Per Column	Amps per Contact	Amps per Module					Vertical Receptacle	Right-Angle Header
25	2	1	83	166	2	14.6	22.9	Yes	10087939-001LF	10087937-001LF
24	2	1	83	166	2	7.3	15.6	No	10078768-001LF	10078770-001LF
24	3	1	75	225	3	7.3	22.9	No	10078902-001LF	10078904-001LF

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

PWRHPBBMP0713EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

METRAL® HIGH POWER CONNECTORS

Part of the Metral Backpanel Connector Family

OVERVIEW

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
- Voltage Rating: 150V
- Rated for up to 80 Amps current for a single module
- Stackable end-to-end with other Metral modules without loss of positions
- Protected backpanel receptacle connector is UL 60950 (Finger Probe) compliant
- Receptacle connectors can be provided with two contact lengths to enable first-mate/last-break sequencing
- Layout compatible with Metral 2mm backpanel connector family
- Press-fit termination

TARGET MARKETS/APPLICATIONS

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

TECHNICAL INFORMATION

MATERIALS

- Housings: 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

- Mating force: 31.2 N max. per connector
- Unmating force: 9.0 N min. per connector
- Press-fit insertion force: 67 N 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
- Per Telcordia Central Office requirements

PACKAGING

- Tubes

ELECTRICAL PERFORMANCE

Number of connectors fully powered	Copper pad weight	Current Ratings (maximum amps per contact)	
		1 x 2	2x2
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	27	12

PART NUMBERS

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

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.

PWRMETHPWR0813EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

METRAL® POWER CONNECTORS

Part of the Metral Backpanel Connector Family

OVERVIEW

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

TARGET MARKETS/APPLICATIONS

- Communication
- Instrumentation
- Medical

TECHNICAL INFORMATION

MATERIALS

- Housings: Liquid crystal polymer (UL94V–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 PERFORMANCE

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

MECHANICAL PERFORMANCE

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

SPECIFICATIONS

- Per Telcordia GR1217–CORE, Central Office requirements

APPROVALS AND CERTIFICATIONS

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

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

PWRMETPWR0813EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

PWRLOPRO™

OVERVIEW

PwrLoPro™ connectors are a family of board-to-board power connectors designed to deliver more current with lower profile height and less board space.

PwrLoPro™ stands 8mm off the edge of the printed circuit board which leaves more space for air flow. The stamped-and-formed power contact can reach the current density of 160A/inch within such compact design. The modular design allows flexible power and signal configurations catering to customer demands as well as other FCI power connectors.

This high-density and low profile connector is developed to meet next generation of 1U application, telecommunications switches, high end servers and hot-pluggable power suppliers.

FCI PwrLoPro™ and TE MINI PAK HDL are mutually second to source each other to ensure supply continuity in the world wide market. These two products are completely inter-matable and inter-changeable.

FEATURES & BENEFITS

- Current rating of 26A for 1 adjacent power contact energized, and 17A for 8 adjacent power contact energized without exceeding a 30°C temperature rise in still air
- 2.75mm between 2 power contacts
- Low profile height (8.0mm) maximizes airflow for effective system cooling
- Highly vented housing design maximizes heat dissipation
- Signal contacts are IMLAs design
- Full modular tooling design to meet customer variable design of power pin and Signal pin requirement; Flexible for power pin and signal pin location
- Blind mating feature and hot pluggable power supplier
- Polarized housing design ensures proper mating
- FMLB contacts, allow up to 3 levels of sequencing
- RoHS and UL compliant

TARGET MARKETS/APPLICATIONS

- AC/DC pluggable power supplies in data, telecom & datacom/networking equipment
- Servers, switch and storage
- Industrial PCs
- Industrial controls & instrumentation

TECHNICAL INFORMATION

MATERIALS

- Contacts: High performance copper alloy
- Plating: 0.76µm (30µin.) precious metal at contact area; 0.5 ~ 1.5µm tin on tail area over nickel plating
- Housings: High temperature thermoplastic, UL94–V0

ELECTRICAL PERFORMANCE

- Contact resistance (maximum change from initial reading after environmental exposure)
  - Power: <5mΩ max.
  - Signal: 20mΩ max.
- Current rating (with < 30°C temperature rise above ambient):
  - Power: Current rating to 26A for 1 adjacent power contact energized, and 17A for 8 adjacent power contact energized in still air
  - Signal: 3A/contact

ENVIRONMENTAL PERFORMANCE

- Operating temperature: – 40°C to 125°C
- RoHS information, this product is compatible according to the European Union Directive 2002/95/IEC

MECHANICAL PERFORMANCE

- Nominal contact wipe distance
  - First mate power: 6.00mm
  - First mate signal: 3.75mm
  - Last mate power: 4.40mm
  - Last mate signal: 2.25mm
- Durability: 250 mating cycles

SPECIFICATIONS

- Product specification: GS–12–1064
- Application specification: GS–20–0362

CERTIFICATIONS & APPROVAL

- UL and CSA under progress, expected to complete in June of 2013

PART NUMBERS

Description	Part Numbers
PWR LO PRO,RAH,25S+10P	Contact FCI for detailed part number information
PWRLOPRO, RAH, 20S+8P	
PWRLOPRO, RAH, 40S+24P	
PWRLOPRO, RAR, 25S+10P	
PWRLOPRO, RAR, 20S+8P	
PWRLOPRO, VTR, 25S+10P	
PWRLOPRO, VTR, 20S+8P	
PWRLOPRO, VTR, 40S+24P	
Any config you desire is available due to full modular design	

PWRLOPRO0813EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

Pwr TwinBlade® CABLE SYSTEM

OVERVIEW

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 100A per contact. The new sensing contacts can be used to eliminate the potential for damage from hot-plug conditions.

The new sensing contacts function as an "electrical" coding to ensure proper mating. Several other features also ensure proper mating such as; an active latch, four different coding options, and polarization. This design provides capability for termination of various cable diameters and wire sizes of 2 x 6mm^2, 10mm^2, 16mm^2 and 25mm^2.

The system consists of cable connectors in orientations of straight or right angle cable exits mating to a right angle board connector.

Cable assemblies terminated with Pwr TwinBlade® connectors are now available and can be customized to any length.

FEATURES

- Up to 100A per twin power contact without exceeding 30°C temperature rise in still air
- New sensing contact added for hot-swap functionality
- Integrated latching design
- Polarized housing and coding design
- Straight and right angle cable exit options
- Recessed touch-proof contacts on both mating halves
- High voltage contact spacing
  - 300V with sensing contacts
  - 600V without sensing contacts

BENEFITS

- Serves mid and high current applications, supporting >140A per linear inch
- Eliminates potential damage from hot-plug conditions
- Minimizes connector and cable footprint
- Ensures proper mating
- Supports various customized needs at customers' end
- No risk in handling while energized
- Meets safety agency requirements
- Overall small size for a 600V connector

TECHNICAL INFORMATION

MATERIALS

- Power Contact Base Material
  - High Conductivity Copper Alloy
- Board Connector and Cable Connector Housings
  - High Temperature Nylon
- Plating
  - Separable Interface: 0.76µm (30µin.)
  - Performance-based plating over Nickel

ELECTRICAL PERFORMANCES

- 100A per contact at 30°C T-rise in still air
- Maximum Operating Voltage: 600V
- Short Circuit Capacity: 5 operations carrying 3000A for 10ms
- Insulation Resistance: 1GΩ when measured in accordance with EIA 364 TP 21

ENVIRONMENTAL

- Operating Temperature Range: -20°C to +75°C

MECHANICAL PERFORMANCE

- Insertion Force: ≤40 N
- Withdrawal Force: ≥15 N
- Durability: 50 cycles

TERMINATION

- Power Wire Sizes:
  - 2 x 6mm²
  - 10mm²
  - 16mm²
  - 25mm²

SPECIFICATIONS

- Product Specifications
  - GS-12-1162
  - GS-12-1246

CERTIFICATIONS & APPROVAL

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

PACKAGING

- Trays

TARGET MARKETS/APPLICATIONS

- Data
  - Server
  - Data Storage
- Communications
  - Telecom & Datacom
- Industrial & Instrumentation
  - Industrial Controls

PART NUMBERS

Description	Power Wire Size	Part Number
Right angle PCB plug	N.A	51939-732LF
Right angle PCB plug with sensing contacts	N.A	51939-901SLF
Kits* with sensing contacts	25mm² wire	10130796-001NELF
Kits* with sensing contacts	16mm² wire	10130796-002NELF
Kits* with sensing contacts	10mm² wire	10130796-003NELF
Right angle receptacle cable assembly	25mm² wire; 1m cable length	10080068-4HEL100LF
Vertical receptacle cable assembly	25mm² wire	10126974-001LF

Reference product drawings for detailed dimensions and complete part numbers.

*Kits consist of the following items: Ejector, Terminal housing, Strain Relief, Nut, Screw, Locking Spring, Cover Top, Cover Bottom, Jumper Assembly, Short assembly terminal, Long assembly terminal

PWRTWINBIOCA0315EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

SOFIX® POWER CABLE ASSEMBLIES

Part of the Metral® Backplane Connector Family

OVERVIEW

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 UL94V-0)
  - Terminals: Copper alloy
  - Covers: Zinc alloy
- Header
  - Housing: Liquid crystal polymer (UL94V-0)
  - Terminals: Copper alloy
  - Covers: Zinc alloy
  - Ground spring: Stainless steel

ELECTRICAL PERFORMANCE

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

MECHANICAL PERFORMANCE

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

SPECIFICATIONS

- 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
- Per Telecordia GR1217-CORE, central office requirements

CERTIFICATIONS & APPROVAL

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

PACKAGING

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

PART NUMBERS

Description	Part Numbers
Header Right Angle with 15 Amp Filter	72846-204LF
Cable Connector Kit	72824-201LF

PWRSOFIXPCA0813EA4

For more information,
please contact: Communications@fci.com
or visit us at www.fci.com

QSFP/QSFP+ COPPER CABLE ASSEMBLIES

40GB/S & 56GB/S & 112GB/S aggregate bandwidth applications
IEEE802.3 & Infiniband QDR & FDR & EDR (Proposed)

OVERVIEW

FCI's QSFP (Quad Small Form–factor Pluggable) connector, cage and cable assemblies are designed to meet emerging data center and high performance computing application needs for a high density cabling interconnect system capable of delivering aggregate data bandwidths of 40Gb/s & 56 Gb/s & 112 Gb/s. This interconnect system is fully compliant with existing industry standard specifications such as the QSFP MSA and IBTA (InfiniBand Trade Association). The QSFP cables support the bandwidth transmission requirements as defined by IEEE 802.3ba (40 Gb/s) and IEEE 802.3bj (100 Gb/s) and Infiniband QDR (4x10 Gb/s per channel) and FDR (4x14 Gb/s per channel) and proposed EDR (4x28 Gb/s per channel) specifications.

The 38 position SMT mounted edge card connector and the cable assembly's mating printed circuit card has been designed for the higher–bandwidth signal integrity requirements associated with 10Gb/s per channel transmission. The metal EMI cage along with the rugged diecast covers on the cable assembly assure proper EMI shielding effectiveness and termination. FCI offers passive cable assemblies that enable the use of a copper based interconnect system for applications with cable lengths up to 6 meters (10G) and 5 meters (14G) and 5 meters (28G). The cage offering also includes a heat sink and mounting clip to address applications where module heat dissipation is required.

FEATURES & BENEFITS

- Fully compatible with IEEE802.3ba, IEEE802.3bj and Infini band QDR & FDR & EDR specifications
- 100Ω differential impedance system
- Allows for 10Gb/s & 14Gb/s & 28Gb/s per channel trans mission; aggregate of 40 Gb/s & 56 Gb/s & 112 Gb/s total bandwidth
- Optimized PCB interface board to minimize crosstalk and insertion loss
- Robust diecast covers for superior EMI shielding effectiveness
- EEPROM for cable signature & system communications
- 30 AWG to 24 AWG cable sizes available
- RoHS compliant

TARGET MARKETS/APPLICATIONS

- Data
  - Servers
  - Networked storage systems
  - Routers
  - External storage systems
  - High Performance Computing (HPC) applications
  - Data center networking
- Communications
  - Switches
  - Routers
- Industry Standards
  - InfiniBand Trade Association (IBTA)
  - IEEE802.3ba
  - IEEE802.3bj
  - 40 Gigabit Ethernet (40G BASE – CR4)
  - 100Gigabit Ethernet (100G BASE – CR4)

QSFP/QSFP+ COPPER CABLE ASSEMBLIES

CABLE ASSEMBLIES

The cable assembly's 38 position printed circuit card has been designed for the higher-bandwidth signal integrity requirements associated with 10Gb/s & 14Gb/s & 28Gb/s per channel transmission. The printed circuit board has also been designed to accommodate the industry (SFF) defined EEPROM cable signature requirements. FCI offers Infiniband QDR and FDR and EDR passive cable assemblies. Rugged diecast covers assure proper EMI termination and shielding effectiveness. Cable assembly removal is enabled via a robust user friendly pull tab. In addition, FCI manufactures these cable assemblies using highly controlled and stable cable assembly manufacturing processes to minimize wire management and termination variations that impact the performance of the cable assembly. Robust final SI based testing and quality systems assure high quality cable assemblies conforming to the high-speed electrical performance requirements in industry specifications.

TECHNICAL INFORMATION

MATERIALS CABLE ASSEMBLY

- Shells: Diecast zinc – Copper underplate with a nickel overplate
- PCB: High performance laminate with gold plated contact pads
- Raw cable: 8 individually shielded parallel pair cables with fully braided EMI shield with low smoke, zero halogen (LSZH) or PVC jacketing
- EMI girdle: Stainless steel
- Pull tab: Thermoplastic polymer
- Release plate: Stainless steel
- Drive screws: Stainless steel

ELECTRICAL PERFORMANCE

- Differential impedance: 100Ω Nominal
- Within pair skew: <10 ps/meter
- Pair-to-pair skew: <50 ps/meter
- Withstanding voltage: 300V DC
- Current rating: 0.5A max. per contact

ENVIRONMENTAL

- Operating temperature range: -20°C to 85°C
- RoHs compliant
- Thermal shock: EIA 364-32, condition1, 25 cycles, -55°C to 85°C
- Temperature life – EIA 364-17, Method A, Condition 2, Time Condition C, 500 hours, 70°C
- Mixed flowing gas – EIA 364-65, Class IIA – 7 days unmated and 7 days mated

MECHANICAL PERFORMANCE

- Durability: 50 cycles
- Mating force: 40 N max.
- Latch strength; axial load: 180 N min.
- Cable axial strain relief: 90 N min.
- Cable flex: 180° flex; 15 cycles per EIA 364-41

SPECIFICATIONS

- GS-12-622 – Product specification – QSFP+ connectors, cages & cable assemblies

APPROVALS AND CERTIFICATIONS

- Infiniband Trade Association (IBTA) Integrators listing

APPLICABLE INDUSTRY STANDARDS

- SFF-8436 QSFP+ Copper and Optical Modules
- SFF-8074i SFP Small Form-Factor Pluggable Transceiver rev 1.0
- SFF-8431 Enhanced SFF Pluggable
- SFF-8661 QSFP+ 28 Gb/s 4X Pluggable Module (Style A)
- SFF-8662 QSFP+ 28 Gb/s 4X Connector (Style A)
- IEEE 802.3 Gigabit-Ethernet standard

PART NUMBERS

Description	Part Numbers
QSFP+ cable assembly – passive – 10G compatible	10093084
10119239 – QSFP+ cable assembly –passive – 14G compatible	10119239
10121178 – QSFP+ cable assembly – passive – 28G compatible	10119239

CABLE ASSEMBLY CAPABILITY MATRIX

- Refer to QSFP+ cable assembly drawing : 10093084, 10119239, 10121178

For more information,
please contact: Communications@fci.com
or visit us at **www.fci.com**

QSFP/QSFP+ COPPER CABLE ASSEMBLIES

CONNECTORS AND CAGES

FCI's QSFP / QSFP+ connector & cage product portfolio includes a 38 position, 0.8mm contact centerline spaced, SMT terminated card edge connector. Also offered is an accompanying single unit (1x1) EMI metal cage that includes a heat sink and associated heat sink mounting clip. The edge card connector and cage are designed to meet all signal integrity requirements and EMI requirements as defined by the SFF–8436 specification. Robust EMI fingers on the cage port assure a robust and reliable EMI shield & termination when placed through the chassis opening. All connector and cage offerings are fully RoHS compliant.

TECHNICAL INFORMATION

MATERIALS CONNECTOR

- Housing: Black thermoplastic, UL94V–0 rated
- Spacer: Black thermoplastic, UL94V–0 rated
- Contact: Phosphor–bronze
- Contact plating : 30µin. min. gold plating on edge card interface with 50µin. nickel under–plate 150µin. min. tin plating on SMT leads with 50µin. nickel underplate

MATERIALS CAGES

- Cage: Copper alloy
- EMI fingers: Copper alloy
- Heat sink: Aluminum alloy
- Heat sink mounting clip: Copper alloy
- Cage plating: 50µin min. nickel plating
- EMI finger plating: 50µin min. tin over 50µin min. nickel
- Heat sink plating: 50µin min. nickel plating
- Heat sink clip plating: 50µin min. nickel plating

ELECTRICAL PERFORMANCE

- Differential impedance: 100Ω +/– 10Ω @ 70ps rise time (20–80%)

ENVIRONMENTAL

- Operating temperature range: –20°C to 85°C
- RoHs compliant
- Thermal shock: EIA 364–32, Condition 1, 25 cycles, –55°C to 85°C
- Temperature life: EIA 364–17, Method A, Condition 2, Time Condition C, 500 hours, 70°C
- Mixed Flowing gas – EIA 364–65, Class IIA – 7 days unmated and 7 days mated

MECHANICAL PERFORMANCE

- Durability: Connectors – 100 cycles
- Connector mating force: 40 N max.
- Cage: Press fit tail termination – insertion force – 40 N per tail

SPECIFICATIONS

- GS–12–622 – Product specification
- GS–20–126 – Application specification

APPLICABLE INDUSTRY STANDARDS

- SFF–8436 QSFP+ Copper and Optical Modules
- SFF–8074i SFP Small Form–Factor Pluggable Transceiver rev 1.0
- SFF–8431 Enhanced SFF Pluggable
- SFF–8472 Diagnostic Monitoring Interface for Optical Transceivers
- IEEE 802.3 Gigabit–Ethernet standard
- Infiniband Trade Association (IBTA)

PART NUMBERS

Description	Part Numbers
QSFP/QSFP+ 38 position connector	10099113
QSFP/QSFP+ 1x1 cage with EMI fingers	10099114
QSFP/QSFP+ cage heat sink	10099115
QSFP/QSFP+ cage heat sink clip	10099116
Integrated cage kit – cage, heat sink and clip assembled	10116015

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