

MINI SAS / SATA Connectors, Cages & Cable Assemblies For High-Speed Serial Mini SAS or Mini SATA 4x Links

DESCRIPTION

FCI's external mini-SAS / SATA connector, cage and cable assembly system solution addresses the storage industry's demand for more compact, high-speed serial I/O interfaces that also support evolving signal speed requirements. Increasing numbers of drives within a system demand additional I/O ports along a card edge, dictating more densely packaged serial I/O solutions. The mini-SAS / SATA I/O system provides a cost-effective, high-speed solution that meets the bandwidth requirements of current and future applications in servers and external storage systems. FCI's connectors and cable assemblies meet Serial Attached SCSI (SAS) or Serial ATA (SATA) requirements for mini-multilane external systems thus assuring inter-mateability with standardized port interfaces. Specifically, FCI's mini-SAS / SATA solutions satisfy the applicable requirements of the INCITS T10 SAS 2.0 & SAS 2.1 specification or the SATA-IO Serial ATA specification and conform to the mechanical requirements described in the associated SFF-8086 and SFF-8088 documents. The availability of both mini-SAS and mini-SATA compatible connectors, cages and cable assemblies gives the user the option to choose the most appropriate and cost-effective link for their respective application.



FEATURES & BENEFITS

Cable Assemblies

- Ruggedized 26-position cabling interconnect system is SFF-8088 (shielded – external) and SFF-8086 compatible
- Available options support Mini SAS (SAS 2.0 & 2.1) and Mini SATA 4x external I/O requirements
- Cable assembly paddle card design is optimized for signal integrity and mechanical performance
- Low profile “pull-to-release” latching system provides secure connection and allows stacking
- Adaptive, robust EMI Gasket and die-cast backshell assure proper EMI shielding
- Robust cable strain relief system isolates cable termination from mechanical stress
- Reduced backshell protrusion provides short cable exit
- Fully compliant with all SAS and SATA defined keying options
- Controlled wire management and termination process assures consistent high-speed electrical performance
- RoHs compliant

TARGET MARKETS / APPLICATIONS

- Data
 - Servers
 - RAID systems
 - Storage racks
 - External storage systems
 - SAS/SATA HBA interfaces
 - Direct-attached storage (DAS)
- Communications
 - Switches
- Industry Standards
 - SATA-IO Serial ATA (SATA) Specification
 - INCITS/ANSI Serial-Attached SCSI (SAS) specification
 - SFF-8088 and SFF-8086

Cable Assemblies

FCI's external mini-SAS / SATA cable assemblies not only address the storage industry's present day need for high-speed serial I/O interfaces (1.5 to 3.0 Gb/s) but they also support evolving higher speed signal speed requirements up to and including 6.0 Gb/s per channel. The cable assemblies use a highly engineered printed circuit board designed to address not only the stringent mechanical interface requirements but also the higher-bandwidth signal integrity thresholds for proper signal transmission as defined by the applicable industry standards. FCI's cable assemblies meet Serial Attached SCSI (SAS) or Serial ATA (SATA) requirements for mini-multilane external cables. Specifically, FCI's mini-multilane cables satisfy the applicable requirements of the INCITS T10 SAS 2.0 and 2.1 specification or the SATA-IO Serial ATA specification and conform to the mechanical requirements described in the associated SFF-8086 and SFF-8088 documents.

A highly controlled and stable cable assembly manufacturing processes minimize wire management and termination variations that impact the performance of the cable assembly. Robust final test and quality systems assure high quality cable assemblies conforming to the high-speed electrical performance requirements in industry specifications.

TECHNICAL DATA

PHYSICAL

- Shells: Diecast zinc – tin plated
- PCB: FR-4 laminate with gold plated contact pads
- Raw cable: 8 individually shielded differential pair cables with fully shielded EMI shield and PVC Jacket
- Pull tab: Nylon resin
- Latch: Stainless steel

ELECTRICAL PERFORMANCE

- Differential Impedance: 100Ω +/- 10Ω @ 70ps rise time (20-80%)
- Insertion Loss: < 8dB @ 12.5 GHz (2.5 Gb/s per channel) (24AWG, 6m)
 < 10dB @ 2.50 GHz (5.0 Gb/s per channel)
 < 16dB @ 5.00 GHz (10.0 Gb/s per channel)
- Near end multi-line crosstalk: <26 dB from 10 MHz to 4.5 GHz
- Within Pair skew: < 10 ps / meter
- Pair-to-pair skew: < 50 ps / meter
- Withstanding voltage: 300V DC
- Current rating: 0.5 amps maximum per contact

MECHANICAL PERFORMANCE

- Durability: 250 cycles
- Mating force: 85N maximum
- Cable axial pull force: 88N minimum
- Latch pull (axial load): 25N minimum

ENVIRONMENTAL

- Operating temperature: -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

REFERENCE DATA

- GS- 12-548 – Product specification Unequalizes Mini-Multilane SAS/SATA cable assemblies



PART NUMBERS

10084749 – Unequalizes Mini-Multilane SAS/SATA cable assemblies

10111837 – mini-SAS / SATA cable assembly – passive – SAS 2.1

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CABLE ASSEMBLY CAPABILITY MATRIX

Mini-SAS / SATA	Unequalized cable length														
	1m	2m	3m	4m	5m	6m	7m	8m	9m	10m	11m	12m	13m	14m	15m
SAS 2.0 (1.5 & 3.0 Gb/s)	28	28	28	26	26	24									
SATA	28	26	28	26	26	24									
SAS 2.1 (6 Gb/s)	28	28	28	28	28	26	26	24	TBD	TBD					

TBD - Cables currently being tested to this standard

Connectors and Cages

FCI's external I/O connector & cage product portfolio includes a 26 position, 0.8mm contact centerline spaced, SMT terminated card edge connector along with accompanying single unit (1x1) or 1x2 ganged EMI die cast cages. The edge card connector and cages are designed to meet all signal integrity requirements and EMI requirements as defined by the INCITS T10 SAS 2.0 and 2.1 specifications or the SATA-IO Serial ATA specification. They also conform to the mechanical requirements as described in the Small Form Factor (SFF) 8086 and 8088 documents. Either cage configuration is offered with either a 0 degree or 1 Degree angle mounting style and with or without location pegs. A robust EMI gasket is included with each cage port in order to assure a robust and reliable EMI shield & termination when placed through the chassis opening. All connector and cage offerings are fully RoHS compliant.

FEATURES & BENEFITS

Connectors & Cages

- 26 position, 0.8mm centerline SMT terminated edge card connector
- Pick-and-place compatible
- Robust die cast cages offered in both 0 degree and 1 degree mounting styles
- Cages offered in single (1x1) and ganged (1x2) versions
- Compliant EMI gasket to assure cage to chassis shield termination
- Both 0 degree and 1 degree cage mounting angles offered for both the 1x1 and 1x2 cages
- RoHS compliant



TECHNICAL DATA

PHYSICAL

Connector

- Housing: Black thermoplastic, UL94V-0 rated
- Contact: Phosphor-bronze
- Contact plating : 30 micro-inch minimum gold plating on edge card interface with nickel under-plate
150 micro-inch minimum tin plating on SMT leads with nickel underplate

Cages

- Cage: Copper alloy
- Cage plating: 150 micro-inch nickel plating on cage with copper underplate

ELECTRICAL PERFORMANCE

- Differential Impedance: 100Ω +/- 10Ω @ 70ps rise time (20-80%)
- Current rating: 0.5 amps maximum per contact
- Signal Integrity – SI-2008-06-006 – mini-SAS / SATA – SATA & SAS 2.0 (available off FCI web site)

MECHANICAL PERFORMANCE

- Durability: Connectors - 250 cycles
- Cage: M2 screw lock downs

ENVIRONMENTAL

- Operating temperature:-40°C to 80°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

REFERENCE DATA

- GS- 12-548 – Product specification- mini-SAS / SATA connectors, cages & cable assemblies
- GS- 20-124 – Application specification - mini- SAS / SATA connectors & cages

PART NUMBERS

10098870 – mini-SAS / SATA 26 position connector

10098871 – mini-SAS / SATA 1x1 cage

10098872 – mini-SAS / SATA 1x2 cage

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For more information about e-catalog or FCI
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