

# SERIAL-ATTACHED SCSI (SAS) CONNECTORS

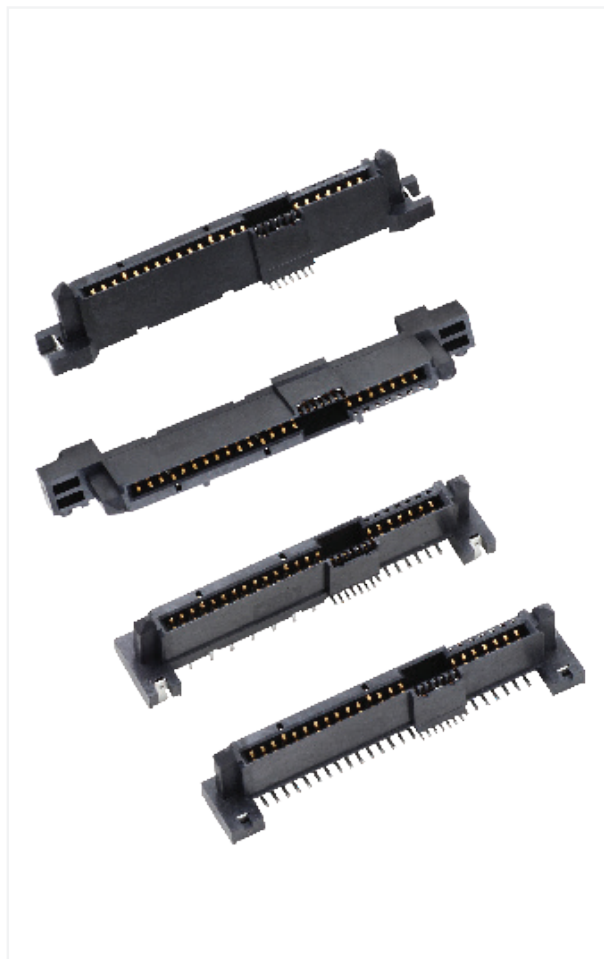
## OVERVIEW

The 29-position, SAS receptacle and plug connectors enable the implementation of the high-speed, Serial Attached SCSI (SAS) hard disk drive (HDD) interface that is replacing the SCSI drive connection in enterprise storage applications in servers and storage systems. This range conforms to SFF8482, SFF8680 and is capable of meeting up to 12Gb/s.

The SAS connector system is designed to support hot plugging and blind mating of HDDs. Staggered contact lengths provide sequential mating of contacts to enable hot plugging. Molded guide posts provide angled lead-in to compensate for connector misalignment, allowing the device plug and the receptacle to self-align during the mating process. Most connectors also feature stamped retention clips that provide additional mechanical strength for robust PCB attachment. FCI also offers wide-base housing options on vertical backplane receptacles for even more stability.

The high-speed, serial interface is designed to support differential signaling, initially at speeds of 3Gb/s and evolving to 12Gb/s. A SAS receptacle accepts either SAS or SATA (Serial ATA) drives, giving the system manufacturer the option to plug either drive to a backplane. Because both technologies have similar electrical interfaces, users have the choice of deploying cost-effective SATA drives for bulk storage or higher-performance SAS drives for mission-critical applications.

FCI offers a wide range of SAS plug and receptacle connectors for enterprise applications. Vertical and Right Angle connector configurations provide options for use in servers, server or storage blades, storage backplanes, HDD carriers and HDDs.



## FEATURES

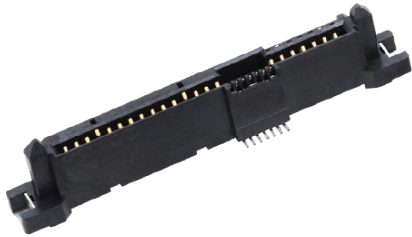
- Connector retainers
  - Staggered contact lengths
  - Molded guide posts
  - Vertical and Right Angle connector configurations
- 
- High speed serial interface is designed to support differential signaling

## BENEFITS

- Provide additional mechanical strength after soldering
  - Provide sequential mating of contacts to enable hot plugging
  - Provides lead-in to compensate for connector misalignment
  - Allows application in Servers, Storage Backplanes, HDD carriers or HDDs
- 
- Support higher data rates transmission up to 12Gb/S

## SERIAL-ATTACHED SCSI (SAS) CONNECTORS

### SAS VERTICAL RECEPTACLES



#### FEATURES & BENEFITS

- For high-speed serial storage interfaces of up to 12 Gb/s
- Typically used for storage backplane or HDD carrier applications
- Options for through-hole solder, press fit, surface mount (SMT), or hybrid (combination of SMT and TM leads) termination allow engineers to select the termination technique best suited to their design
- Wide-base housing options provide additional stability

| Performance | Termination Type               |        |                                   | Retainers |           |         |       | Locators | Other Features                               | Part Number |
|-------------|--------------------------------|--------|-----------------------------------|-----------|-----------|---------|-------|----------|----------------------------------------------|-------------|
|             | Power                          | Port 2 | Port 1                            | SMT       | Fork-lock | Harpoon | Blade |          |                                              |             |
| 12Gb/s      | SMT                            |        |                                   | √         |           |         |       | √        | Same footprint as 6Gb/s 10031567             | 10120818    |
| 12Gb/s      | SMT                            |        |                                   | √         |           |         |       | √        | Shorter soldertails                          | 10120909    |
| 12Gb/s      | SMT                            |        |                                   | √         |           |         |       |          |                                              | 10120998    |
| 12Gb/s      | SMT                            |        |                                   | √         |           |         |       | √        | Wide base, various locator lengths available | 10122272#   |
| 12Gb/s      | SMT                            |        |                                   |           |           |         | √     | √        | Wide base                                    | 10123000#   |
| 12Gb/s      | Thru-hole, staggered           |        | SMT                               |           |           |         | √     | √        | Wide base                                    | 10120863#   |
| 12Gb/s      | Press-fit, in-line footprint   |        |                                   |           |           | √       |       | √        |                                              | 10125340    |
| 6Gb/s       | Thru-hole, in-line footprint   |        |                                   |           | √         |         |       | √        |                                              | 10018182*   |
| 6Gb/s       | Press-fit, staggered footprint |        |                                   |           | √         | √       |       | √        | Wide base                                    | 10038064*   |
| 6Gb/s       | Press-fit, staggered footprint |        |                                   |           |           |         |       | √        | Wide base (full length), various width       | 10045782*   |
| 6Gb/s       | Press-fit, in-line footprint   |        |                                   |           |           | √       |       | √        |                                              | 10031077*   |
| 6Gb/s       | Thru-hole, staggered           | SMT    | Signals :SMT<br>Ground: Thru-hole |           | √         |         | √     | √        | Wide base                                    | 10036876*   |
| 6Gb/s       | SMT                            |        |                                   |           |           |         | √     | √        | Wide base                                    | 10039845*   |
| 6Gb/s       | SMT                            |        |                                   | √         |           |         |       | √        |                                              | 10031567*   |
| 6Gb/s       | SMT                            |        |                                   | √         |           |         |       | √        |                                              | 10036355*   |
| 6Gb/s       | SMT                            |        |                                   | √         |           |         |       | √        | 17.85mm extended height                      | 10038334*   |
| 6Gb/s       | SMT                            |        |                                   | √         |           |         |       | √        | Wide base                                    | 10076579*   |
| 6Gb/s       | Thru-hole, staggered           | SMT    | Signals: SMT<br>Ground: Thru-hole | √         |           |         |       | √        |                                              | 10077259*   |
| 6Gb/s       |                                |        |                                   |           | √         |         |       | √        |                                              | 10036312*   |
| 6Gb/s       | SMT                            |        |                                   | √         |           |         |       | √        | Wide base                                    | 10123071*   |

# connector mounts to PCB layout defined in SFF-8680 specification

\* connector mounts to PCB layout defined in SFF-8482 specification

For more information,  
please contact: [Communications@fci.com](mailto:Communications@fci.com)  
or visit us at [www.fci.com](http://www.fci.com)

#### Disclaimer

Please note that the above information is subject to change without notice.

## ► SERIAL-ATTACHED SCSI (SAS) CONNECTORS

### SAS RIGHT ANGLE RECEPTACLES



#### FEATURES & BENEFITS

- Address server blade, storage blade, embedded systems, or HDD carrier applications
- Surface mount (SMT) termination
- A receptacle with 7.07mm offset from the surface of the carrier board provides 4.7mm nominal clearance for components to be mounted beneath an installed 2.5in. hard drive

| Performance | Termination Type | Offset from Surface of Carrier PCB* | Retainers |           |       | Locators | Other Features                   | Part Number |
|-------------|------------------|-------------------------------------|-----------|-----------|-------|----------|----------------------------------|-------------|
|             |                  |                                     | SMT       | Fork-lock | Blade |          |                                  |             |
| 12Gb/s      | SMT              | 2.85mm                              | √         |           |       | √        |                                  | 10124274    |
| 12Gb/s      | SMT              | 0.35mm                              | √         | √         | √     | √        | Same footprint as 6Gb/s 10035202 | 10123371    |
| 6Gb/s       | SMT              | 0.35mm                              | √         | √         | √     | √        |                                  | 10035202    |
| 6Gb/s       | SMT              | 0.93mm                              |           | √         | √     |          |                                  | 10036587    |
| 6Gb/s       | SMT              | 7.07mm                              | √         | √         | √     | √        | Extended Height                  | 10044002    |

\*Dimension measured from the PCB surface to the centerline of the molded guide posts on the receptacle connector.

### SAS VERTICAL HEADERS



#### FEATURES & BENEFITS

- For high-speed serial storage interfaces of up to 12 Gb/s
- Address server blade, storage blade, embedded systems, or HDD carrier applications
- Surface mount (SMT) termination

| Performance | Termination Type | Retainers |           | Rivet Holes | Part Number |
|-------------|------------------|-----------|-----------|-------------|-------------|
|             |                  | SMT       | Fork-lock |             |             |
| 12Gb/s      | SMT              | √         |           |             | 10129880    |
| 12Gb/s      | SMT              | √         |           |             | 10126428    |
| 6Gb/s       | SMT              | √         |           |             | 10031193    |
| 6Gb/s       | SMT              | √         |           |             | 10041724    |
| 3Gb/s       | SMT              |           |           | √           | 10045105    |

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## SERIAL-ATTACHED SCSI (SAS) CONNECTORS

### SAS RIGHT ANGLE HEADERS



#### FEATURES & BENEFITS

- For high-speed serial storage interfaces of up to 12 Gb/s
- Address server blade, storage blade, embedded systems, or HDD carrier applications
- A receptacle with 7.07mm offset from the surface of the carrier board provides 4.7mm nominal clearance for components to be mounted beneath an installed 2.5" hard drive

| Performance | Termination Type | Offset from Surface of Carrier PCB* | Retainers |           | Other Features                   | Part Number |
|-------------|------------------|-------------------------------------|-----------|-----------|----------------------------------|-------------|
|             |                  |                                     | SMT       | Fork-lock |                                  |             |
| 12Gb/s      | SMT              | -0.80mm                             |           | √         | Same footprint as 6Gb/s 10034524 | 10129900    |
| 12Gb/s      | Straddle Mount   | 2.64mm                              |           |           |                                  | 10124928    |
| 6Gb/s       | SMT              | 0.20mm                              | √         |           |                                  | 10099439    |
| 6Gb/s       | SMT              | -0.20mm                             | √         |           |                                  | 10098678    |
| 6Gb/s       | SMT              | -0.80mm                             |           | √         |                                  | 10034524    |

Note:

"-ve" mean that the connector is below the PCB sitting surface.

"+ve" mean that the connector is above the PCB sitting surface.

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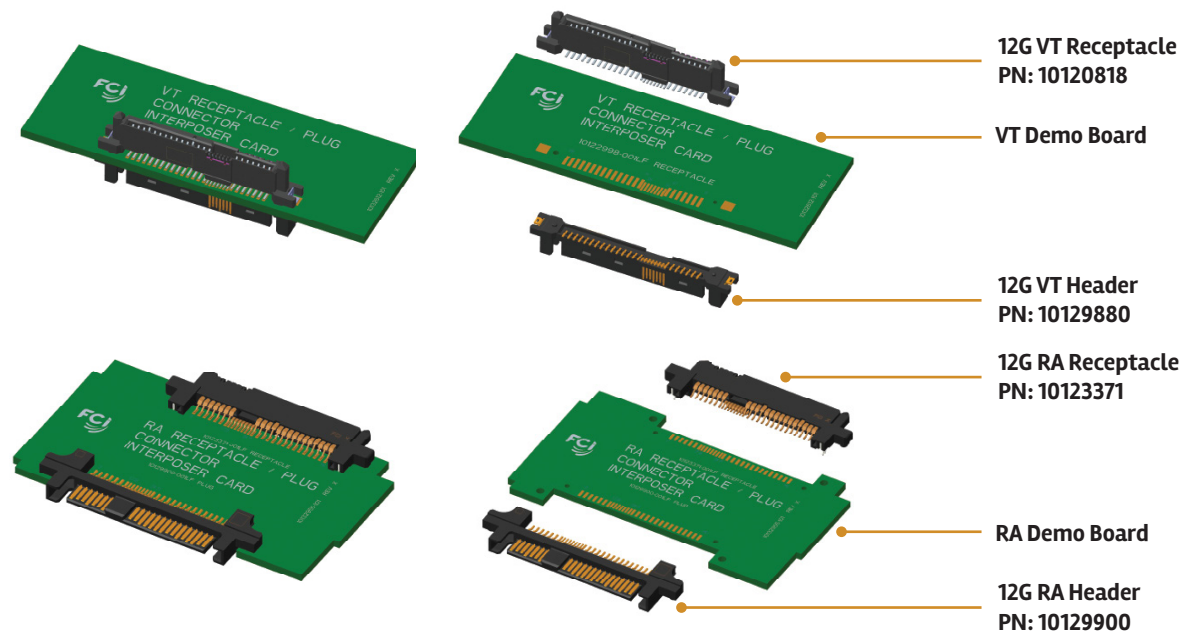
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## SERIAL-ATTACHED SCSI (SAS) CONNECTORS

### 12GB/S SAS INTERPOSER CARDS/ PADDLE CARDS

SAS interposer cards/ paddle cards are typically placed between the Hard Disk Drive (HDD) and backplane within a storage system. It facilitates data translation and HDD system monitoring or upgrading. Each card consists of one header and one receptacle and it comes with Vertical or Right angle options.

FCI developed the portfolio of 12Gb/s SAS connectors addressing the needs of interposer cards as shown in the following diagrams.





## TECHNICAL INFORMATION

### MATERIALS

- Contact Base metal: Copper Alloy
- Contact Area finish: Gold over Nickel
- Solder Area finish: Tin over Nickel
- Retainer Clip Base Metal: Copper Alloy
- Retainer Finish: Tin over Nickel
- Housing: High-Temperature Thermoplastic (UL 94V-0); Black

### ELECTRICAL PERFORMANCE

- Contact Resistance: 30mΩ max. initial; 15mΩ max. change after test
- Current Rating: 1.5A min. per contact with temperature rise not exceeding 30°C

### ENVIRONMENTAL

- Humidity: 96 hours at 40°C with 90–95% relative humidity. Per EIA 364–31, Method II, test condition A
- Temperature Life: 85°C for 500 hours. Per EIA 364–17 test condition III, method A
- Thermal Shock: 10 cycles between –55°C and +85°C Per EIA 364–32, test condition I
- Mixed Flowing Gas: Expose 1/2 samples unmated for 7 days and then mated for 7 additional days; the other 1/2 samples are exposed mated for 14 days. Per EIA 364–65, class II A

### MECHANICAL PERFORMANCE

- Durability: 500 mating cycles\*
- Mating Force: 50 N max./45 N max. (32P–4lane SAS)
- Unmating Force: 5 N min./4.5 N min. (32P–4lane SAS)

\*For higher durability cycling application, please contact FCI for alternatives.

### SPECIFICATIONS

- FCI Product specification:
  - 6G SAS: GS–12–282 (29P SAS), GS–12–294 (32P–4lane SAS)
  - 12G SAS: GS–12–1120
- SFF–8482 Specification for Unshielded Dual Port Serial Attachment Connector

### APPROVALS AND CERTIFICATIONS

- UL

### PACKAGING

- Tray
- Tube
- Tape–on–reel (available upon request)

### TARGET MARKETS/APPLICATIONS

- Data
  - Servers
  - Server and storage blades
  - External storage systems
  - HDDs
  - HDD carriers
- Communications
  - Processor and storage blades
  - Mezzanine cards
- Industrial, Instrumentation & Medical
  - Embedded system boards

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