

MINI-SAS HIGH DENSITY

Connectors & Cable Assemblies



Mini-SAS High Density (HD) Connectors & Cable Assemblies

TE Connectivity's (TE's) Mini-SAS HD (high density) product family includes compact, high-speed I/O solutions for SAS applications: storage, rack-mount servers, workstations, storage racks, high performance computing, HBAs (host bus adapters), RAID (redundant arrays of inexpensive disks), switches and more. The product family supports speeds up to 12 Gb/s and includes the following interfaces:

- Internal receptacles and copper cable assemblies
- External receptacles and copper cable assemblies

The interfaces are adopted for the SAS-2.1 and SAS-3 standards. The reduced size of the interconnects saves additional 30% to 50% PCB space; a low profile PCIe card can accommodate 4 Mini-SAS HD connectors versus 2 SAS connectors.

Internal Mini-SAS HD Connector

TE's internal Mini-SAS HD connector is a 12 Gb/s high-density, high-speed interface capable of supporting an aggregate data rate of 48 Gb/s per connector (12G x 4 lanes) with a version capable of transferring an aggregate data rate of 192 Gb/s. Designed to be approximately 30 % smaller than conventional internal Mini-SAS connectors, the internal Mini-SAS HD connector enables you to save precious PCB space. Additionally, the connector has been adopted by SAS 2.1 and SAS 3 specifications.

Featuring both right angle and vertical orientations, TE's internal Mini-SAS HD interconnects suit a variety of architectures in multiple applications: enterprise storage, high-performance computing, networking and data centers. The connector supports direct passive and active copper cable assemblies.

Electrical

- Signal integrity performance meets SAS-2.1 at 6 Gb/s and SAS-3 at 12 Gb/s requirements
- Voltage rating: 30 volts AC
- Current rating: Signal application only
- Cable assemblies are compliant to SAS 2.1 and SFF-8643

Mechanical

- Plug insertion force: 50N Max
- Plug extraction force: 25N Max
- Latch retention: 50N Min
- Durability: 250 cycles
- Cables compliant to SFF-8643 mini-multilane interface specification
- Cable construction consists of 8 differential pairs bundles 2 cables with 4 pairs in each cable

Materials

- Receptacle housing: LCP
- Contacts: Copper Alloy
- Chicklets: LCP



Features

- **High Density, High-Speed:** Aggregate data transfer of 48 Gb/s; capable of transferring 192 Gb/s in the 1x4 version
- **Compact Size:** 0.75mm contact pitch that's 30% smaller than existing products
- **Faster Installation:**
 - Press-fit/SMT termination
 - Pre-assembled, one-piece connector
 - Keying for proper plug orientation
- **Flexibility:**
 - 1x1, 1x2 and 1x4 configurations available
 - Plug options for direct passive and active copper cable assemblies
 - Stacked board interface with 36 positions per 1x1
- **Error-Proof:** Screw mounted for additional retention
- 100 and 85 Ohm impedance

Protocols

- SAS-2.1 at 6 Gb/s
- Capable of SAS 3.0 at 12 Gb/s
- SFF-8643

Technical Documents

- Product Specification: 108-32038
- Application Specification: 114-32101

Internal Mini SAS HD Connector Part Numbers

Part Number	Orientation	Configuration	Impedance	
2227580-1	Right Angled Press-fit	1x1	100 Ohms	
2227581-1	Right Angled Press-fit	1x2	100 Ohms	
2227582-1	Right Angled Press-fit	1x4	100 Ohms	
2227595-1	Vertical Press-fit	1x1	100 Ohms	
2227640-1	Vertical Press-fit	1x2	100 Ohms	
2227642-1	Vertical Press-fit	1x4	100 Ohms	

Internal Mini-SAS HD Connector Part Numbers

Part Number	Orientation	Configuration	Impedance
TBD	Vertical SMT	1x1 1x2 1x4	100 Ohms
TBD	Right Angled Press-fit	1x1	85 Ohms
TBD	Vertical SMT	1x1 1x2 1x4	85 Ohms

External Mini-SAS HD Connector

TE's Mini-SAS HD external receptacle connector is a high-density, high-speed IO interface adopted for the SAS 2.1 standard and proposed for SAS 3.0 standard. The product is designed to support 6 Gb/s and 12 Gb/s SAS applications. The assembly is offered in 4x, 8x, and 16x versions.

Electrical

- Connector signal integrity performance meets requirements of current SAS-2.1 at 6 Gb/s, and capable of compliance with SAS-3 at 12 Gb/s
- Voltage rating: 120 volts AC
- Current rating: Signal application only
- Cable assemblies are fully compliant to SAS 2.1 and SFF-8644

Mechanical

- Plug insertion force: 100N Max
- Plug extraction force: 50N Max
- Latch retention: 133.5N Min
- Durability: 250 cycles
- Cable backshell compliant to SFF-8644 mini-multilane interface specification
- Cable construction consists of 8 differential pairs bundles 2 cables with 4 pairs in each cable

Materials

- Receptacle housing: LCP
- Shield assembly: Nickel Silver
- Contacts: Copper Alloy
- EMI Spring: Copper Alloy
- Threaded nut: Brass
- Chicklets: LCP

External Mini SAS HD Connector Part Numbers

P/N	Description
2149027-1	1x1 Receptacle Assembly
2149966-1	1x2 Receptacle Assembly
2149375-1	1x4 Receptacle Assembly
2198484-1	1X1 Receptacle Assembly with lightpipe
2198483-1	1x2 Receptacle Assembly with lightpipe
2180736-1	1x4 Receptacle Assembly with lightpipe



Features

- **High Speed:** Broadband design for 6 and 12 Gbps
- Board receptacle provides 1x1 (4x), 1x2 (8x) and 1x4 (16x) configurations
- **Easy Installation:** Preassembled, one-piece interconnect offers one-step placement onto PCB
- Lightpipe options available
- REACH and RoHS compliant
- Improved cable latch design
- Enhanced EMI skirt design
- **Scalable:** 4x and 8x cable plug options
- 26, 28, and 30 AWG bulk cable

Protocols

- SAS-2.1 at 6 Gb/s
- SAS-3 at 12 Gb/s

Technical Documents

- Product Specification: 108-2462
- Application Specification: 114-3316

External Mini-SAS HD Copper Cable Assembly

The passive direct attach external Mini-SAS HD copper cable assembly is designed for broadband operation optimized for 6 and 12 Gb/s. The EEPROM signature enables the host to identify what type and length of cable is connected to its port, and can be customized for any application. An improved latch design reduces the insertion force and increases the retention force. MADISON CABLE brand TurboTwin bulk cable, and the dual 4 pair cable exit backshell provide flexibility for routing.

Materials

- PCB paddle card interface
- 30 m gold plated contact pads
- Tin plated zinc diecast backshells
- Tin over nickel plated copper alloy EMI spring

External Mini-SAS HD Cable Assembly Part Numbers

P/N	Description	Data Rate	AWG	Minimum Maximum	
				Length	Length
2202501-1 thru -8	4x Passive	6/12 G	26	0.5m	7m
2202502-1 thru -6	4x Passive	6/12 G	28	0.5m	5m
2202503-1 thru -4	4x Passive	6/12 G	30	0.5m	3m
2202504-1 thru -8	8x Passive	6/12 G	26	0.5m	7m
2202505-1 thru -6	8x Passive	6/12 G	28	0.5m	5m
2202506-1 thru -4	8x Passive	6/12 G	30	0.5m	3m
2202507-1 thru -8	4x Passive	6 G	26	0.5m	7m
2202508-1 thru -6	4x Passive	6 G	28	0.5m	5m



Features

- SFF-8644, SAS-2.1 and SAS 3.0 compliant
- Broadband design for 6 and 12 Gb/s
- Board receptacle assembly provide 1x1(4x), 1x2(8x) and 1x4(16x) configuration
- Pre-assembled, one piece connector and cage assembly offers one-step placement to the board
- Lightpipe option available
- REACH and RoHS compliant
- Improved cable latch design
- Enhanced EMI skirt design
- Scalable 4x and 8x cable plug options

For More Information

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