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SFF Committee

SFF-8655

Specification for

0.6mm 4/8X 24 Gb/s Unshielded I/O Connector

Rev 1.0 February 12, 2015

Secretariat: SFF Committee

Abstract: This specification defines the general performance requirements for the 0.6mm 24 Gb/s unshielded I/O connector that is designed for use in high speed serial interconnect applications. One such use is as an 8 lane receptacle and mating cable plug for internal SAS connections.

This specification provides a common reference for systems manufacturers, system integrators, and suppliers. This document is an internal working specification of the SFF Committee, an industry ad hoc group.

This specification is made available for public review, and written comments are solicited from readers. Comments received by the members will be considered for inclusion in future revisions of this specification.

The description of a connector in this specification does not assure that the specific component is actually available from connector suppliers. If such a connector is supplied, it must comply with this specification to achieve interoperability between suppliers.

Support: This specification is supported by the identified member companies of the SFF Committee.

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EXPRESSION OF SUPPORT BY MANUFACTURERS

The following member companies of the SFF Committee voted in favor of this industry specification:

tbd

The following member companies of the SFF Committee voted against this industry specification:

tbd

The following member companies of the SFF Committee voted to abstain on this industry specification:

tbd

The user's attention is called to the possibility that implementation to this Specification may require use of an invention covered by patent rights. By distribution of this specification, no position is taken with respect to the validity of a claim or claims or of any patent rights in connection therewith. Members of the SFF Committee which advise that a patent exists are required to provide a statement of willingness to grant a license under these rights on reasonable and non-discriminatory terms and conditions to applicants desiring to obtain such a license.

Update History

Rev 1.0

- The speed characteristics and electrical considerations of SFF-8654 were used to create SFF-8655.

Foreword

The development work on this specification was done by the SFF Committee, an industry group. The membership of the committee since its formation in August 1990 has included a mix of companies which are leaders across the industry.

When 2 1/2" diameter disk drives were introduced, there was no commonality on external dimensions e.g. physical size, mounting locations, connector type, and connector location, between vendors.

The first use of these disk drives was in specific applications such as laptop portable computers and system integrators worked individually with vendors to develop the packaging. The result was wide diversity, and incompatibility.

The problems faced by integrators, device suppliers, and component suppliers led to the formation of the SFF Committee as an industry ad hoc group to address the marketing and engineering considerations of the emerging new technology.

During the development of the form factor definitions, other activities were suggested because participants in the SFF Committee faced more problems than the physical form factors of disk drives. In November 1992, the charter was expanded to address any issues of general interest and concern to the storage industry. The SFF Committee became a forum for resolving industry issues that are either not addressed by the standards process or need an immediate solution.

Those companies which have agreed to support a specification are identified in the first pages of each SFF Specification. Industry consensus is not an essential requirement to publish an SFF Specification because it is recognized that in an emerging product area, there is room for more than one approach. By making the documentation on competing proposals available, an integrator can examine the alternatives available and select the product that is felt to be most suitable.

SFF Committee meetings are held during T10 weeks (see www.t10.org), and Specific Subject Working Groups are held at the convenience of the participants. Material presented at SFF Committee meetings becomes public domain, and there are no restrictions on the open mailing of material presented at committee meetings.

Most of the specifications developed by the SFF Committee have either been incorporated into standards or adopted as standards by EIA (Electronic Industries Association), ANSI (American National Standards Institute) and IEC (International Electrotechnical Commission).

If you are interested in participating or wish to follow the activities of the SFF Committee, the signup for membership and/or documentation can be found at www.sffcommittee.com/ie/join.html

The complete list of SFF Specifications which have been completed or are currently being worked on by the SFF Committee can be found at <ftp://ftp.seagate.com/sff/SFF-8000.TXT>

If you wish to know more about the SFF Committee, the principles which guide the activities can be found at <ftp://ftp.seagate.com/sff/SFF-8032.TXT>

Suggestions for improvement of this specification will be welcome. They should be sent to the SFF Committee, 14426 Black Walnut Ct, Saratoga, CA 95070.

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1. Scope

general performance requirements for the 0.6mm 24 Gb/s unshielded I/O connector that is designed for use in high speed serial interconnect applications.

1.1 Application Specific Criteria

This connector interface is capable of meeting the high speed internal I/O electrical performance requirements of T10 SAS.

2. References

2.1 Industry Documents

- ASME Y14.5 Dimensioning and Tolerancing
- EIA 364 Series Electrical Connector/Socket Test Procedures Including Environmental Classifications.
- IPC-A-610 Acceptability of Electronic Assemblies
- INCITS 519 Serial Attached SCSI - 3 (SAS-3)
- INCITS 534 Serial Attached SCSI - 4 (SAS-4)
- SFF-8410 High Speed Serial Testing for Copper Links
- SFF-8654 0.6mm 4/8X Unshielded I/O Connector
- SFF-9400 Universal 4/8X Pinouts

2.2 SFF Specifications

There are several projects active within the SFF Committee. The complete list of specifications which have been completed or are still being worked on are listed in the specification at <ftp://ftp.seagate.com/sff/SFF-8000.TXT>

2.3 Sources

Those who join the SFF Committee as an Observer or Member receive electronic copies of the minutes and SFF specifications (<http://www.sffcommittee.com/ie/join.html>).

Copies of ANSI standards may be purchased from the InterNational Committee for Information Technology Standards (<http://www.techstreet.com/incitsgate.tmp1>).

2.4 Conventions

The dimensioning conventions are described in ANSI-Y14.5, Geometric Dimensioning and Tolerancing. All dimensions are in millimeters, which are the controlling dimensional units (if inches are supplied, they are for guidance only).

The ISO convention of numbering is used i.e., the thousands and higher multiples are separated by a space and a period is used as the decimal point. This is equivalent to the English/American convention of a comma and a period.

American	French	ISO
0.6	0,6	0.6
1,000	1 000	1 000
1,323,462.9	1 323 462,9	1 323 462.9

3. General Description

This specification identifies the documentation required to implement a four or eight lane 24 Gb/s unshielded connector suitable to the using applications, as illustrated in the following pictorial representation.

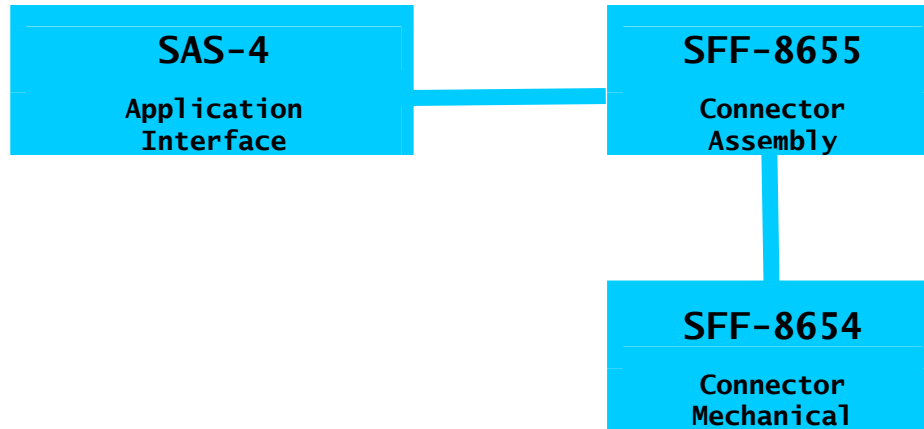


FIGURE 3-1 DOCUMENTATION TO IMPLEMENT A 24 GB/S CONNECTOR

4. Overview of Referenced Specifications

4.1 Application Requirements

The electrical and EMI considerations for the use of this connector are specified by the using standards listed in Section 1.1

4.2 SFF-8654

The connector system specification defines a right angle receptacle connector (fixed) and a straight receptacle connector (fixed), the mating plug assembly (free) which can be a straight plug version or a right angle plug version, and the latching mechanism.

The design of this connector system is intended to reduce the footprint and form factor versus the MiniSAS HD 8i or the MiniSAS HD 4i receptacle connector while providing better signal integrity performance at data rates up to 24 Gb/s, especially with improved NEXT and FEXT performance. The mating plug is designed to work better with ribbon type cables and provide easier routing of the cables and better air flow for cooling in typical blade and mainstream server designs.

Figure 4-1 represents a typical 8X straight plug to right angle receptacle configuration of this connector system.

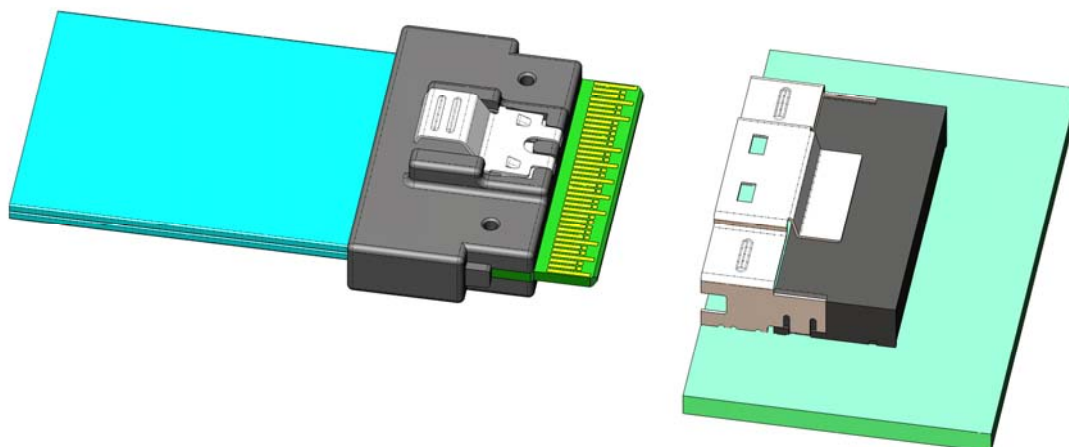


FIGURE 4-1 TYPICAL 8X APPLICATION VIEW

Figure 4-2 represents an alternative application view consisting of an 8X right angle plug to straight or vertical receptacle configuration of this connector system.

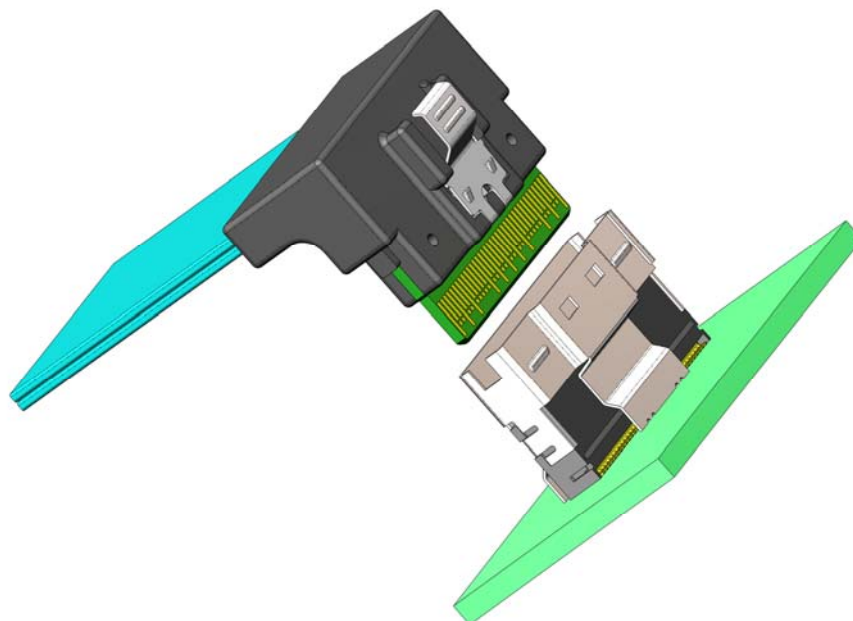


FIGURE 4-2 ALTERNATIVE 8X APPLICATION VIEW

Figure 4-3 represents a typical 4X straight plug to right angle receptacle configuration of this connector system.

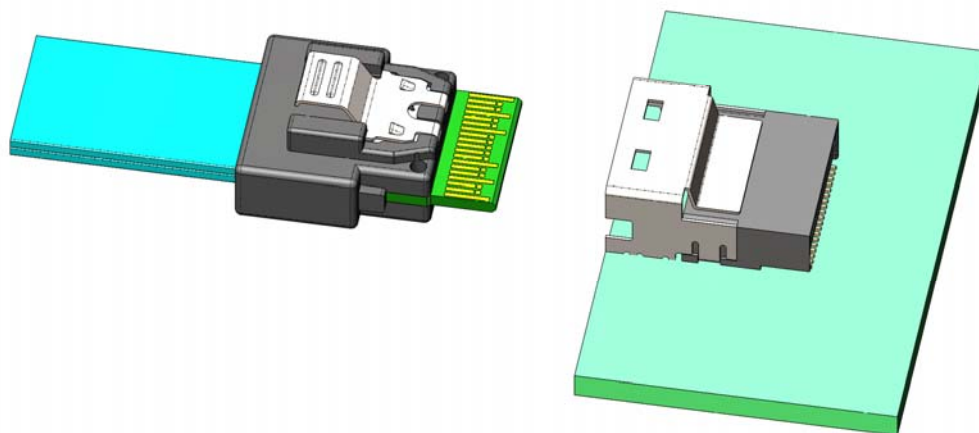


FIGURE 4-3 TYPICAL 4X APPLICATION VIEW

Figure 4-4 represents an alternative application view consisting of an 4X right angle plug to straight or vertical receptacle configuration of this connector system.

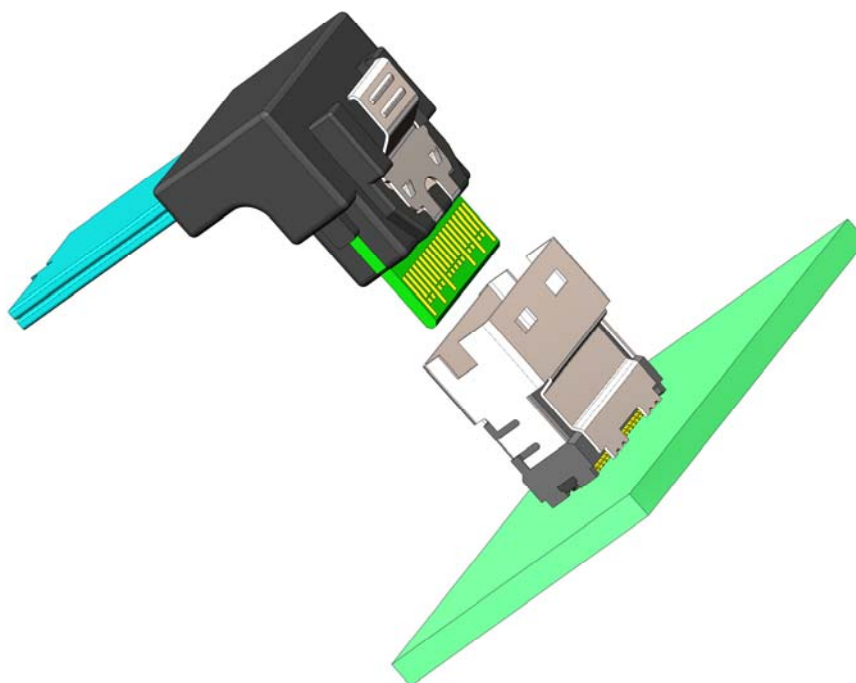


FIGURE 4-4 ALTERNATIVE 4X APPLICATION VIEW