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SFF specifications are available at ftp://ftp.seagate.com/sff

SFF Committee

SFF-9400

Specification for

Universal 4X/8X Pinout

Rev 0.2   April 28, 2015

Secretariat: SFF Committee

Abstract: This specification outlines a set of connector pin signal definitions for an internal cable interface. The definitions are not functionally compatible but do prevent physical damage. Possible applications include, but are not limited to, SAS-3 and SAS-4.

This specification provides a common reference for systems manufacturers, system integrators, and suppliers. This 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

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, 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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FIGURES

SFF Committee --

Universal 4X/8X Pinout

1. Scope

This specification outlines a set of connector pin signal definitions for a two row internal cable connector interface. The definitions are not functionally compatible but do prevent physical damage when two different pinout options are mated. Possible applications include, but are not limited to, SAS-3 and SAS-4. The intent is to facilitate greater flexibility and increased usage.

1.1 Application Specific Criteria

SAS-3: 12Gbps physical layer data rate
SAS-4: TBD physical layer data rate

2. References

2.1 Industry Documents

TBD

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.tmpl).

2.4 Conventions

The dimensioning conventions are described in ANSI-Y14.5M, 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

2.5 Definitions

For the purpose of SFF Specifications, the following definitions apply:

GND: Signal return pin sometimes referred to as a ground

HS: High speed differential pair signal pin

Optional: This term describes features which are not required by the SFF

Specification. However, if any feature defined by the SFF Specification is implemented, it shall be done in the same way as defined by the Specification. Describing a feature as optional in the text is done to assist the reader. If there is a conflict between text and tables on a feature described as optional, the table shall be accepted as being correct.

SB: Sideband signal pin

Vendor Specific: This term is used the signal on a connector pin and its actual function is determined by each vendor and not reserved for future standardization.

3. General Description

Both 4X and 8X pinouts include a combination of high speed differential pairs and vendor specific signals. Figure 3-1 and Figure 3-2 illustrate the location of vendor specific pins for 4X and 8X connector pinouts respectively. Each vendor specific block consists of ten pins.

RSV	GND	HS	HS	GND	HS	HS	GND	VENDOR SPECIFIC					GND	HS	HS	GND	HS	HS	GND	RSV
RSV	GND	HS	HS	GND	HS	HS	GND						GND	HS	HS	GND	HS	HS	GND	RSV

FIGURE 3-1 LOCATION OF VENDOR SPECIFIC PINS IN 4X PINOUT

GND	HS	HS	GND	HS	HS	GND	VENDOR SPECIFIC					GND	HS	HS	GND	HS	HS	GND	RSV	RSV	GND	HS	HS	GND	HS	HS	GND	VENDOR SPECIFIC					GND	HS	HS	GND	HS	HS	GND
GND	HS	HS	GND	HS	HS	GND						GND	HS	HS	GND	HS	HS	GND	RSV	RSV	GND	HS	HS	GND	HS	HS	GND						GND	HS	HS	GND	HS	HS	GND

FIGURE 3-2 LOCATION OF VENDOR SPECIFIC PINS IN 8X PINOUT

3.1 Type 1 4X Pinout

The type 1 4X pinout assigns all vendor specific pins as discrete sideband signals as shown in Figure 3-3.

RSV	GND	HS	HS	GND	HS	HS	GND	SB	SB	SB	SB	SB	GND	HS	HS	GND	HS	HS	GND	RSV
RSV	GND	HS	HS	GND	HS	HS	GND	SB	SB	SB	SB	SB	GND	HS	HS	GND	HS	HS	GND	RSV

FIGURE 3-3 TYPE 1 4X PINOUT

3.2 Type 2 4X Pinout

The type 2 4X pinout assigns seven vendor specific pins as discrete sideband signals and three for an additional high speed differential pair as shown in Figure 3-4.

RSV	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	SB	SB	GND	HS	HS	GND	HS	HS	GND	RSV
RSV	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	SB	SB	GND	HS	HS	GND	HS	HS	GND	RSV

FIGURE 3-4 TYPE 2 4X PINOUT

3.3 Type 3 4x Pinout

The type 3 4X pinout assigns all vendor specific pins for high speed differential

pairs as shown in Figure 3-5.

RSV	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	RSV
RSV	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	RSV

FIGURE 3-5 TYPE 3 4X PINOUT

3.4   Type 1 8X Pinout

The type 1 8X pinout assigns all vendor specific pins as discrete sideband signals as shown in Figure 3-6.

GND	HS	HS	GND	HS	HS	GND	SB	SB	SB	SB	SB	GND	HS	HS	GND	HS	HS	GND	RSV	RSV	GND	HS	HS	GND	HS	HS	GND	SB	SB	SB	SB	SB	GND	HS	HS	GND	HS	HS	GND
GND	HS	HS	GND	HS	HS	GND	SB	SB	SB	SB	SB	GND	HS	HS	GND	HS	HS	GND	RSV	RSV	GND	HS	HS	GND	HS	HS	GND	SB	SB	SB	SB	SB	GND	HS	HS	GND	HS	HS	GND

FIGURE 3-6 TYPE 1 8X PINOUT

3.5   Type 2 8X Pinout

The type 2 8X pinout assigns fourteen vendor specific pins as discrete sideband signals and two additional high speed differential pairs as shown in Figure 3-7.

GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	SB	SB	GND	HS	HS	GND	HS	HS	GND	RSV	RSV	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	SB	SB	GND	HS	HS	GND	HS	HS	GND
GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	SB	SB	GND	HS	HS	GND	HS	HS	GND	RSV	RSV	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	SB	SB	GND	HS	HS	GND	HS	HS	GND

FIGURE 3-7 TYPE 2 8X PINOUT

3.6   Type 3 8X Pinout

The type 3 8X pinout assigns all vendor specific pins for high speed differential pairs as shown in Figure 3-8.

GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND
GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND	HS	HS	GND

FIGURE 3-8 TYPE 3 8X PINOUT