

SFF Committee documentation may be purchased in electronic form.
SFF specifications are available at <ftp://ftp.seagate.com/sff>

SFF Committee
SFF-8301 Specification for
Form Factor of 3.5" Disk Drives
Rev 1.6 March 16, 2010

Secretariat: SFF Committee

A prior generation of this specification has been incorporated as a standard of the Electronic Industries Association, and can be purchased through Global Engineering (303-792-2181) in hard copy form as EIA-740.

Since the EIA standard was published, there have been changes introduced by industry.

EIA standards and draft standards are not available electronically, so the SFF provides electronic copies of this specification.

Abstract: This document defines the dimensions for 3.5" magnetic disk drives.

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.

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.

EMC
ENDL
FCI
Hewlett Packard
Hitachi GST
IBM
Intel
Molex
Unisys

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

Amphenol
Avago
ETRI
Finisar
Foxconn
Micrel
NetApp
OpNext
QLogic
Seagate
Toshiba
Toshiba America
Tyco
Volex

Change History:

January 27, 2010:

Added new bottom fastener position A13 dimension (3.000 in)
Added new bottom fastener position choice description to section 4.1

March 16, 2010:

Updated new bottom fastener position choice description in section 4.1 as per advice of the committee at the March 2010 meeting.

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 sign up 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.

SFF Committee --

Form Factor of 3.5" Disk Drives

1. Scope

The 83xx suite of specifications defines the configuration characteristics associated with 3.5" disk drives.

The purpose of the 83xx suite is to define the external characteristics of drives such that products from different vendors may be used in the same mounting configurations.

The set of specifications provide external dimensions, connectors, connector placement, mounting holes and interface pinouts to assist manufacturers in the systems integration of small form factor disk drives.

- SFF-8300 contains general information regarding connector space, mounting considerations and measurement requirements.
- SFF-8301 defines the dimensions of 3.5" disk drives.
- Other specifications in the 83xx family define the location of connectors on 3.5" disk drives.

In an effort to broaden the applications for storage products, an ad hoc industry group of companies representing system integrators, peripheral suppliers, and component suppliers decided to address issues which appear in the marketplace that affect many OEMs and vendors.

The SFF Committee was formed in August, 1990 and the first working document was introduced in January, 1991.

1.1 Description of Clauses

Clause 1 contains the Scope and Purpose.
Clause 2 contains Referenced and Related Standards and SFF Specifications.
Clause 3 contains the General Description.
Clause 4 contains detailed characteristics.

2. References

The SFF Committee activities support the requirements of the storage industry, and it is involved with several standards.

2.1 Industry Documents

The following interface standards are relevant to many SFF Specifications.

- X3.131R-1994 SCSI-2 Small Computer System Interface
- X3.253-1995 SPI (SCSI-3 Parallel Interface)
- X3.302-xxxx SPI-2 (SCSI-3 Parallel Interface -2)
- X3.277-1996 SCSI-3 Fast 20
- X3.221-1995 ATA (AT Attachment) and subsequent extensions

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://tinyurl.com/c4psg>).

2.4 Conventions

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.

English	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:

Height: Distance from board surface to farthest overall connector feature

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.

Reserved: Where this term is used for defining the signal on a connector pin its actual function is set aside for future standardization. It is not available for vendor specific use. Where this term is used for bits, bytes, fields and code values; the bits, bytes, fields and code values are set aside for future standardization. The default value shall be zero. The originator is required to define a Reserved field or bit as zero, but the receiver should not check Reserved fields or bits for zero.

3. General Description

The application environment for small form factor disks is any computer connecting to one or more disks in a restricted packaging environment. The purpose of an SFF Specification is to provide information that will assist vendors to design products that can fit the same packaging envelope.

Small form factor disks are widely-used where low power and small size are important configuration parameters.

The application environment for small form factor disks is any computer connecting to one or more disks in a restricted packaging environment.

4. 3.5" Form Factor

4.1 Mounting Holes

There are four to six mounting holes on the bottom and two on each side.

Although a disk vendor may provide for three positions per side, systems manufacturers may find that the hole located between the two specified holes is not in the same location relative to the other holes for a wide selection of drives. For this reason, the middle hole has not been specified and is considered optional.

The pair of bottom mounting holes located by dimension A7 is required. One additional pair of bottom mounting holes are required, either the pair of mounting holes located by dimension A6 or the pair of mounting holes located by dimension A13. Providing all three pairs of mounting holes (located by dimensions A7, A6 and A13) is allowed.

4.2 Dimensions

In the tables, references offset to the left in the dimensions column are variables, and those to the right are tolerances.

Table 4-1 defines the dimensions of the drive represented in Figure 4-1.

TABLE 4-1 3.5" DISK DRIVE DIMENSIONS

Dimension	Millimeters	Inches
A 1	17.80 *	0.700 *
A 1	26.10 *	1.028 *
A 1	42.00 *	1.654 *
A 2	147.00 *	5.787 *
A 3	101.60	4.000
A 4	95.25	3.750
A 5	3.18	0.125
A 6	44.45	1.750
A 7	41.28	1.625
A 8	28.50	1.122
A 9	101.60	4.000
A10	6.35	0.250
A11	0.25	0.010
A12	0.50	0.020
A 13	76.20	3.000

* = maximum

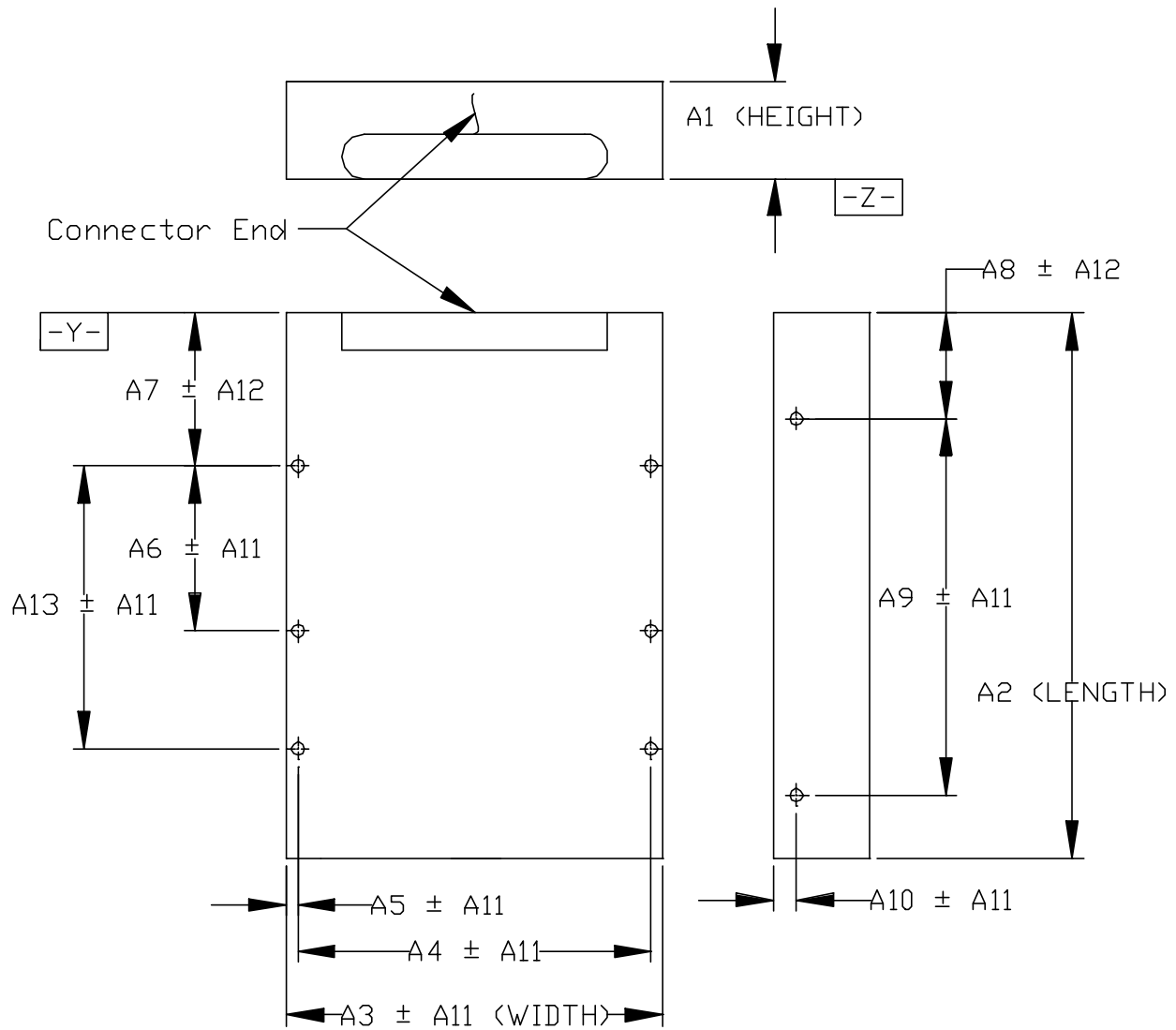


FIGURE 4-1 FORM FACTOR OF 3.5" DISK DRIVE