

SFF Committee

**SFF-8301**

Specification for

**3.5" Form Factor Drive Dimensions**

**Standardized as EIA-740 1999/07 at Rev 1.4 dated September 24, 2001**

This specification was submitted as a project to the Electronic Industries Alliance by being incorporated into SFF-8300, and was Expired at that time.

EIA standards can be purchased from <http://global.ihs.com/>

**Subsequent to adoption by EIA, this specification has been revised**

The editor had cause to generate a new revision, the details of which are reflected in the Update History on the 'Expression of Support by Manufacturers' page.

Until these changes have been adopted by the EIA, this specification represents the latest information.

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

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**SFF-8301**

Specification for

**3.5" Form Factor Drive Dimensions**

Rev 1.8

August 30 2014

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.

3M  
Adaptec  
Cirrus Logic  
EMC  
ENDL  
Foxconn  
Hewlett Packard  
HGST  
Honda Connector  
IBM  
Intel  
Luxshare-ICT  
Madison Cable  
Maxtor  
Methode  
Seagate  
Sigmax  
TE Connectivity  
Unisys

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

Amphenol  
Avago  
DEC  
Dell Computer  
ETRI  
FCI  
Finisar  
Micrel  
Molex  
NetApp  
Oclaro  
QLogic  
Sandisk  
Sumitomo  
Toshiba  
Volex

**Change History:**

Rev 1.5 (January 27, 2010)

- Added new bottom fastener position A13 dimension (3.000 in) to Figure 4-1.
- Added new bottom fastener position choice description to Section 4.1

Rev 1.6 (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.

Rev 1.7 (February 8, 2013)

- Note on thread size omitted from redrawn Figure 4-1 included in Table 4-1.

Rev 1.8 (August 30, 2014)

- Editorial changes for consistency between specifications in revised EIA-740.

## 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](http://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](http://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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SFF Committee --

### 3.5" Form Factor Drive Dimensions

#### 1. Scope

This specification defines the dimensions of 3.5" disk drives.

##### 1.1 Application Environment

The environment for the 35" Drive Form Factor is any computer, cabinet, or enclosure connecting to one or more drives in a restricted packaging environment.

The purpose of this Specification is to provide information that will assist vendors to design products that can fit the same packaging envelope.

#### 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 standards are relevant to many SFF Specifications.

- ASME Y14.5M      Dimensioning and Tolerancing
- 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 ([www.techstreet.com/incitsgate.html](http://www.techstreet.com/incitsgate.html)).

##### 2.4 Conventions

The dimensioning conventions are described in ASME-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:

**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

#### 3.1 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.

#### 3.2 Dimensions

**TABLE 3-1 3.5" DISK DRIVE DIMENSIONS**

Dimension	Millimeters		Inches	
		Max		Max
A 1	17.80	Max	0.700	Max
A 1	26.10	Max	1.028	Max
A 1	42.00	Max	1.654	Max
A 2	147.00	Max	5.787	Max
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	
A13	76.20		3.000	
<b>Threads</b>				
Size			6-32 UNC-28	
Penetration	3.0	Min	3.8	Max



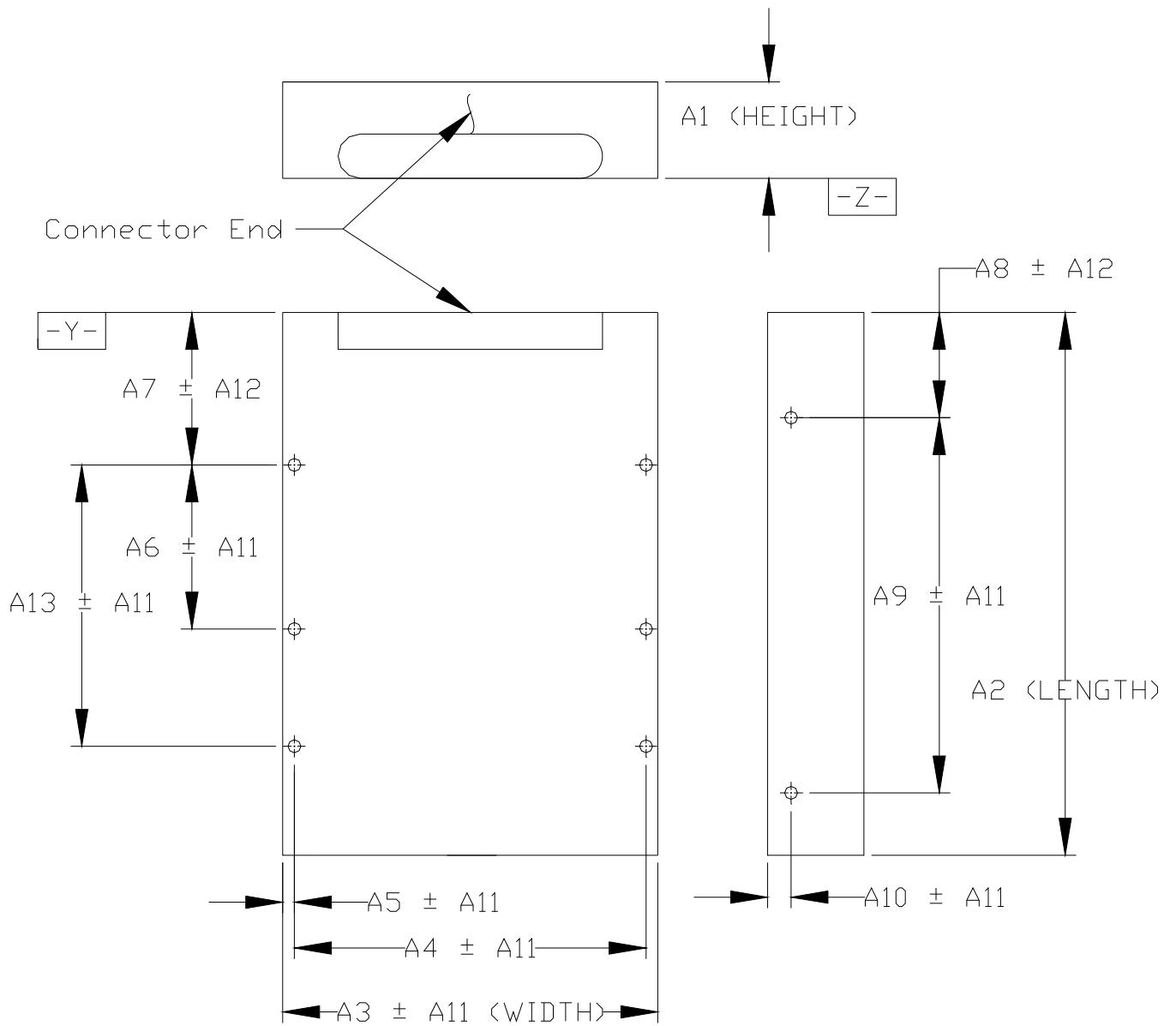


FIGURE 3-1 FORM FACTOR OF 3.5" DISK DRIVE