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SFF TWG
Technology Affiliate

SFF-8351

Former Specification for

3.5” Form Factor Drive with High Density Connector

Rev 3.0 November 12, 2021

SECRETARIAT: SFF TA TWG

ABSTRACT: This specification formerly defined the mechanical attributes of the 3.5" form factor drive with high density connector. This form factor differs from previous versions of 3.5" drives in that it only has side mounting holes rather than both side and bottom mounting holes and defines the location of a high density connector that provides power, sideband signals, and up to eight or sixteen high speed data lanes.

REASON FOR EXPIRATION: Obsolete
This specification is no longer relevant to the industry because this form factor was not implemented.

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SFF specifications are available at http://www.snia.org/sff/specifications

SFF-8351

Specification for

3.5" Form Factor Drive with High Density Connector

Rev 2.0 January 19, 2018

Secretariat: SFF TA TWG

Abstract: This specification defines the mechanical attributes of the 3.5" form factor drive with high density connector.

This form factor differs from previous versions of 3.5" drives in that it only has side mounting holes rather than both side and bottom mounting holes and defines the location of a high density connector that provides power, sideband signals, and up to eight or sixteen high speed data lanes.

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

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Intellectual Property

The user's attention is called to the possibility that implementation of this Specification may require the 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. This specification is considered SNIA Architecture and is covered by the SNIA IP Policy and as a result goes through a request for disclosure when it is published. Additional information can be found at the following locations:

- Results of IP Disclosures: http://www.snia.org/sffdisclosures
- SNIA IP Policy: http://www.snia.org/ippolicy

Change History

Rev 0.0 March 30, 2016
- Initial release.

Rev 0.1 May 4, 2016
- Added major content and mechanical drawings.

Rev 0.2 May 31, 2016
- Updated mechanical drawings and dimension table.
- Changed mounting screws to the same as previous 3.5” form factor (SFF-8301).

Rev 0.3 June 3, 2016
- Corrected A32 metric dimension

Rev 0.4 September 20, 2016
- Updated mechanical dimension table.

Rev 0.5 November 15, 2016
- Added datum notes to Table 3-1.

Rev 0.6 March 8, 2017
- Added LED location.

Rev 1.0 March 31, 2017
- Approval ballot completed for specification publication.

Rev 1.0.1 November 3, 2017
- Removed LED requirement.
- Relocated connector.
- Changed X16 connector clearance to optional.
- Added width target areas.
- Changed connector opening to minimum instead of toleranced.
- Added lead in requirement for mounting holes.
- Changed fastener penetration from threads to dimensions.
- Updated figures.

Rev 1.0.2 December 20, 2017
- Updated SFF-8000 links.
- Updated Figure 3-2 title.

Rev 2.0 January 19, 2018
- Publication of revision 2.0.

Foreword

The development work on this specification was done by the SNIA SFF TWG, an industry group. Since its formation as the SFF Committee in August 1990, the membership 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 SFF Committee provided a forum for system integrators and vendors to define the form factor of disk drives.

During their definition, other activities were suggested because participants in SFF faced more challenges than the form factors. 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.

In July 2016, the SFF Committee transitioned to SNIA (Storage Networking Industry Association), as a TA (Technology Affiliate) TWG (Technical Work Group).

Industry consensus is not a requirement to publish a 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 meets during the T10 (see www.t10.org) and T11 (see www.t11.org) weeks, and SSWGs (Specific Subject Working Groups) are held at the convenience of the participants. Material presented to SFF becomes public domain, and there are no restrictions on the open mailing of the presented material by Members.

Many of the specifications developed by SFF have either been incorporated into standards or adopted as standards by ANSI, EIA, JEDEC and SAE.

For those who wish to participate in the activities of the SFF TWG, the signup for membership can be found at:

http://www.snia.org/sff/join

The complete list of SFF Specifications which have been completed or are currently being worked on by the SFF Committee is contained in the document SFF-8000 which can can be found at:

http://www.snia.org/sff/specifications

Suggestions for improvement of this specification will be welcome, they should be submitted to:

http://www.snia.org/feedback

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1. Scope

This specification defines the mechanical attributes of the 3.5" form factor drive with high density connector.

1.1 Application Specific Criteria

This 3.5" drive form factor provides external dimensions, connector, connector placement, and mounting hole locations to assist manufacturers in the systems integration of this form factor.

The environment for the 3.5" Drive Form Factor with High Density Connector is a computer, cabinet, or enclosure connecting to one or more drives in a restricted packaging environment.

1.2 Copyright

1.3 Disclaimer

Suggestions for revisions should be directed to http://www.snia.org/feedback/

2. References

2.1 Industry Documents

- ANSI-Y14.5, Geometric Dimensioning and Tolerancing
- SFF-8631 Serial Attachment X8/X16 Unshielded Device Connector
- SFF-8667 Module with High Density Connector for Enclosure Applications
- SFF-TA-1000 2.5” Form Factor Drive with High Density Connector

2.2 Sources

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 https://ta.snia.org/higherlogic/ws/public/download/1211/latest/SFF-8000.xlsx.

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

2.3 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

2.4 Definitions

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

Height: The vertical distance from the bottom surface to the farthest overall drive feature.

3. General Description

SFF-8351 defines the location of the SFF-8631 connector on a 3.5" drive form factor that has mounting holes located on the sides and no mounting holes on the bottom.

This specification defines a drive that may be directly inserted into the backplane of a cabinet, without the need for a cable, and provides information necessary to assist manufacturers in the systems integration of small form factor drives. This specification allows only one location for the interface connector on the drive.

Provision exists in the SFF-8631 connector for improved mating via guides. Staggered pin lengths incorporate provision for mating ground prior to mating any other signals. Extra pins are provided for implementation of enclosure services and PCI Express® (PCIe®) sidebands.

Care needs to be taken in the application of this drive so that excessive stress is not exerted on the connector. Backplane configurations should pay particular attention so that the connector is not damaged due to excessive side loading, compressive forces, or from supporting the weight of the device.

Table 3-1 defines the dimensions associated with the form factor as illustrated in Figure 3-1 and the positioning of the SFF-8631 connector as illustrated in Figure 3-2. Figure 3-2 illustrates the X8 version of the connector, but the dimensions apply to both the X8 and X16 versions unless otherwise specified.

Threaded holes on the form factor shall include a lead in feature. Exact configuration of the lead in is not defined since the implementation of the form factor is beyond the scope of this specification. An example lead in for a cast aluminum implementation is a countersink of 4 mm diameter x 90º (0.157" diameter x 90º). Appropriate information regarding recommended screw type and torque should be included in the product data sheet to enable proper mounting of the device without damaging threads.

TABLE 3-1 3.5" FORM FACTOR DRIVE WITH SFF-8631 CONNECTOR DIMENSIONS

Dimension	Millimeters	Inches	Comments
A1	15.00	0.591	Height
A2	147.00	5.787	Length
A3	101.60	4.000	Width
A4	0.25	0.010	Tolerance
A5	28.50	1.122	Mounting hole location
A6	130.10	5.122	Mounting hole location
A7	6.00	0.236	Mounting hole location
A8	34.62	1.363	Horizontal keepout location
A9	53.50	2.106	Minimum keepout width X8
A10	90.30	3.555	Minimum keepout width X16 (optional)
A11	7.90	0.311	Minimum keepout height
A14	6.60	0.260	Minimum keepout depth
A17	0.25	0.010	Position Tolerance
A18	6.00	0.236	Width mounting surface
A22	13.70	0.539	Connector horizontal location
A23	2.85	0.112	Connector vertical location
A24	21.65	0.852	Connector depth location
A25	3.10	0.122	Connector guide feature defining Datum B (see SFF-8631)
A26	48.10	1.894	Connector width (see SFF-8631)
A27	1.60	0.063	Connector tongue thickness (see SFF-8631)
A28	0.25	0.010	Parallelism
A29	0.50	0.020	Surface profile
A30	0.40	0.016	Perpendicularity
A31	0.00	0.000	Tolerance
A32	0.30	0.012	Tolerance
Threads			
A19	6-32 UNC-2B		Thread size
A20	2.39	0.094	Minimum fastener penetration
A20	3.56	0.140	Maximum fastener penetration

Notes:
1. Datums A and B are connector datums (see SFF-8631). Datum C is defined by this specification to locate the connector on the form factor and does not correlate with SFF-8631 Datum C.
2. Datums W, X, Y, and Z are form factor datums.
3. Threaded holes A19 shall include a lead in feature.
4. Dimension A20 applies to fasteners used to mount the device. The device shall accept the maximum fastener penetration.

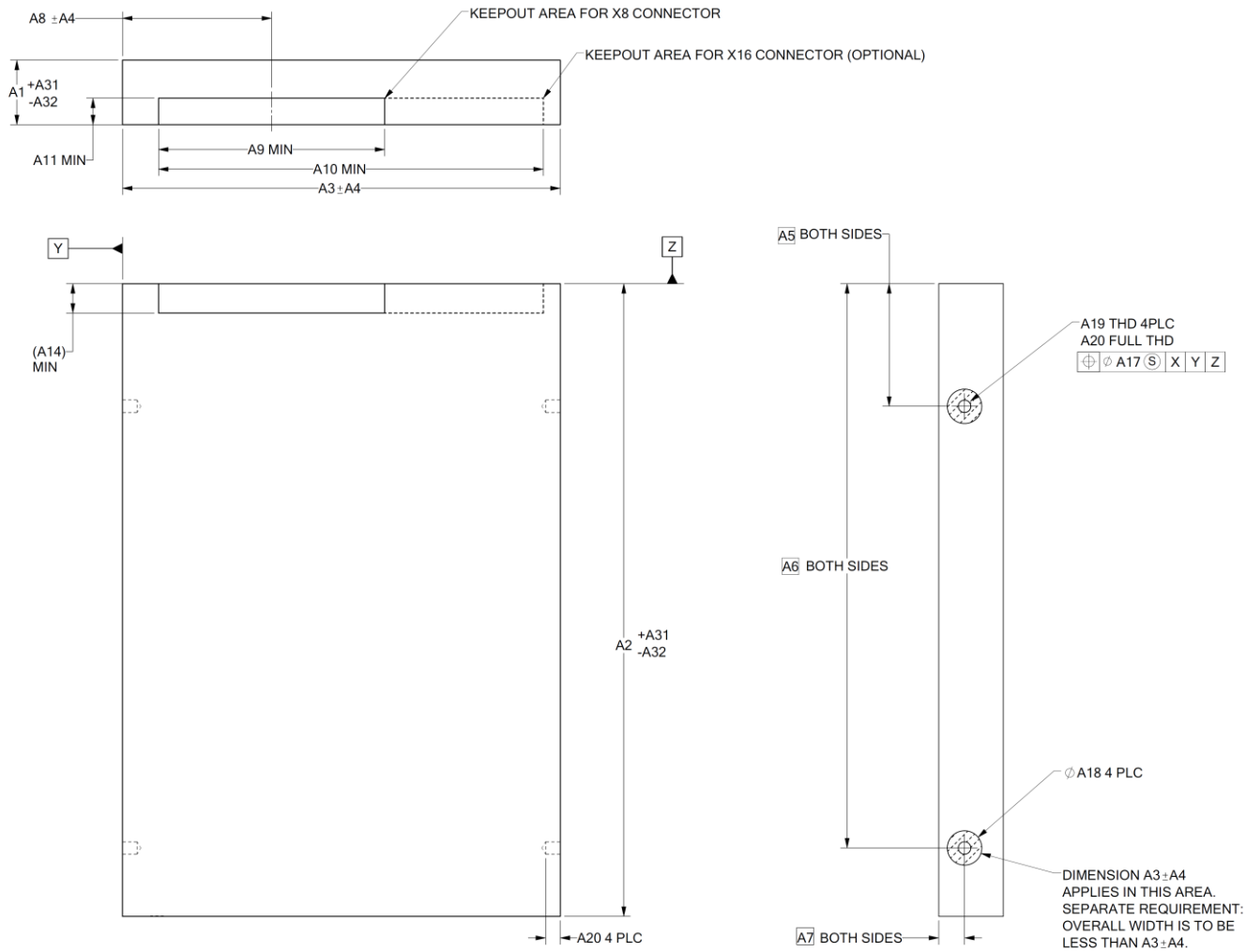

FIGURE 3-1 3.5" FORM FACTOR DRIVE WITH SFF-8631 CONNECTOR

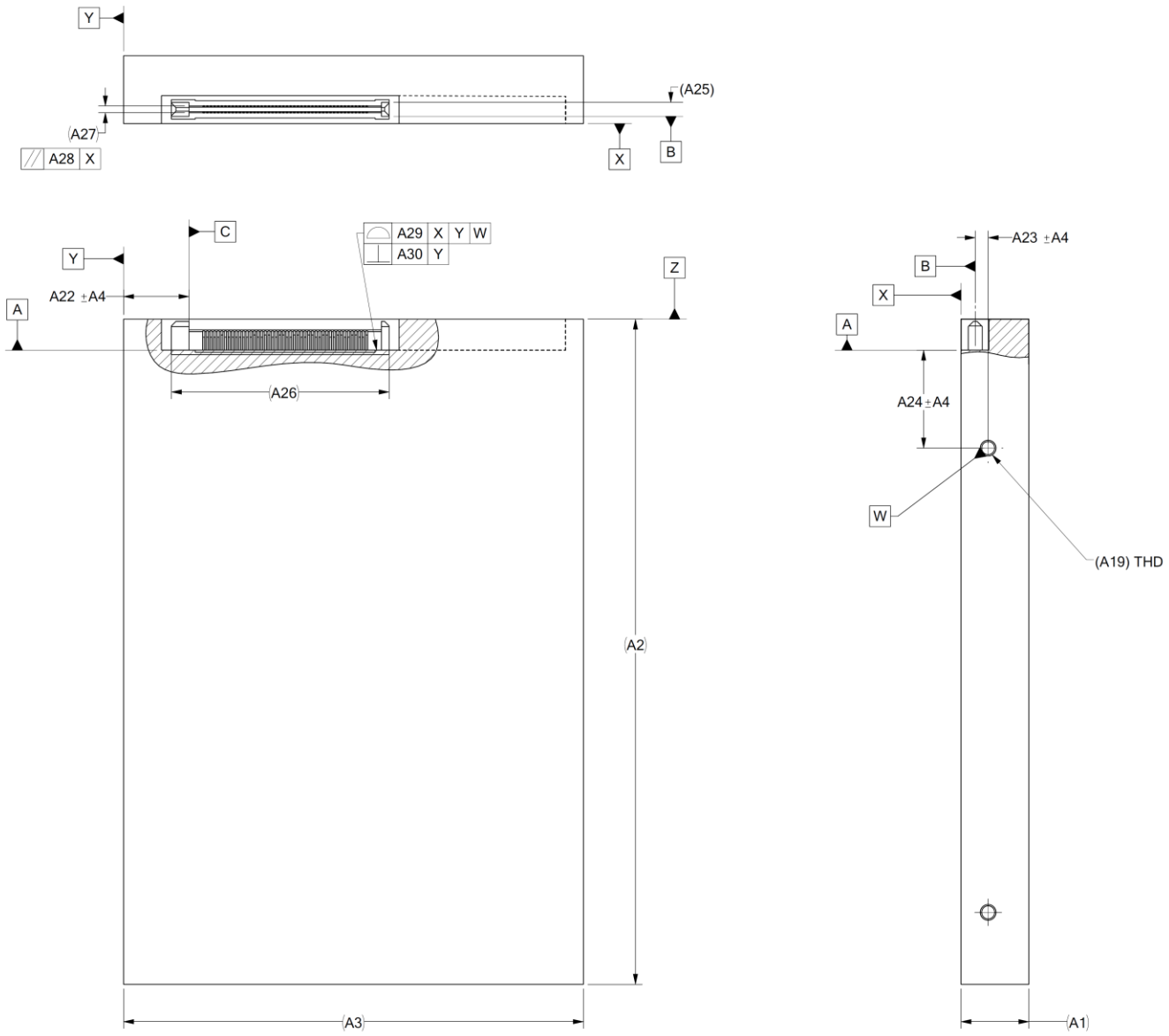

FIGURE 3-2 SFF-8631 CONNECTOR LOCATION DETAILS ON THE 3.5" FORM FACTOR