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SFF Committee

SFF-8553 Specification for

Form Factor of 5 1/4" 7mm Height Optical Drives with SATA Interface

Rev 1.0 February 27, 2009

Secretariat: SFF Committee

Abstract: This specification defines the dimensions for 5 1/4" 7mm height optical drives with SATA Interface.

This document provides a common specification for systems manufacturers, system integrators, and suppliers of optical drives. This is an internal working document 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 document.

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
Foxconn
Hewlett Packard
IBM
Panasonic
Pioneer NewMedia
Sun Microsystems

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

3M
AMCC
Amphenol
Arista Networks
Cinch
Emulex
ETRI
FCI
Finisar
Fujitsu CPA
Hitachi GST
LSI
Molex
Sandisk/RAD
Seagate
Tyco
Volex

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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.

SFF Committee --

Form Factor of 5 1/4" 7mm Height Optical Drives with SATA Interface

1. Scope

SFF-8553 defines the configuration characteristics associated with 7mm Height 5 1/4" Optical Drives. *Note: By naming convention, the 5 1/4" width dimension is used however these drives are actually closer to 5" wide but use the same media as 5 1/4" drives.*

The purpose of the 85xx 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 drives.

- SFF-8500 contains general information regarding connector space, mounting considerations and measurement requirements.
- SFF-8501 defines the dimensions of 5 1/4" disk drives.
- SFF-8551 defines the dimensions of 5 1/4" CD-ROM drives.
- SFF-8552 contains information on the mechanical form factor of 5 1/4" 9.5mm and 12.7mm height drives with Parallel ATA Interface including dimensions, connector location, and mounting considerations
- SFF-8553 contains information on the mechanical form factor of 5 1/4" 7mm height drives with SATA Interface including dimensions, connector location, and mounting considerations
- Other specifications in the 85xx family define the location of connectors on 5 1/4" 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 to broaden the applications for storage devices, and is an ad hoc industry group of companies representing system integrators, peripheral suppliers, and component suppliers.

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 the Definitions and Conventions
Clause 5 contains the 5 1/4" 7mm Height Optical Drive SATA Form Factor

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.

- X3.221-1995 ATA (AT Attachment) and subsequent extensions
- X3T10/0948 ATA-2 (ATA Extensions)
- Serial ATA Revision 3.0, Serial ATA International Organization

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).

3. General Description

The application environment for the 5 1/4″ 7mm Height (slimline) Optical Drive Form Factors is any computer, cabinet, or enclosure connecting to one or more drives in a restricted packaging environment. Slimline Optical Drives are widely-used where low power and small size are important configuration parameters.

This specification defines the dimensions, mounting considerations, and connector location for slimline optical drives. The purpose of an SFF Specification is to provide information that will assist vendors to design products that can fit the same packaging envelope.

4. Definitions and Conventions

4.1 Definitions

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

4.1.1 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.

4.1.2 PUM: Pickup Assembly Module or Traverse Assembly.

4.1.3 SATA (Serial AT Attachment) describes a device with built-in SATA protocol electronics.

4.2 Conventions

If there is a conflict between text and tables on a feature described as optional, the table shall be accepted as being correct.

Certain terms used herein are the proper names of signals. These are printed in uppercase to avoid possible confusion with other uses of the same words; e.g., ATTENTION. Any lower-case uses of these words have the normal American-English meaning.

A number of conditions, commands, sequence parameters, events, English text, states or similar terms are printed with the first letter of each word in uppercase and the rest lower-case; e.g., In, Out, Request Status. Any lower- case uses of these words have the normal American-English meaning.

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 American-English 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

5. 5 1/4" 7mm Height Optical Drive SATA Form Factor

This section of the specification defines the configuration characteristics associated with 5 1/4" 7mm height optical drives. Table 5-1 lists the dimensions associated with Figure 5-1, which is a detail of the form factor. Tolerances are shown in the table.

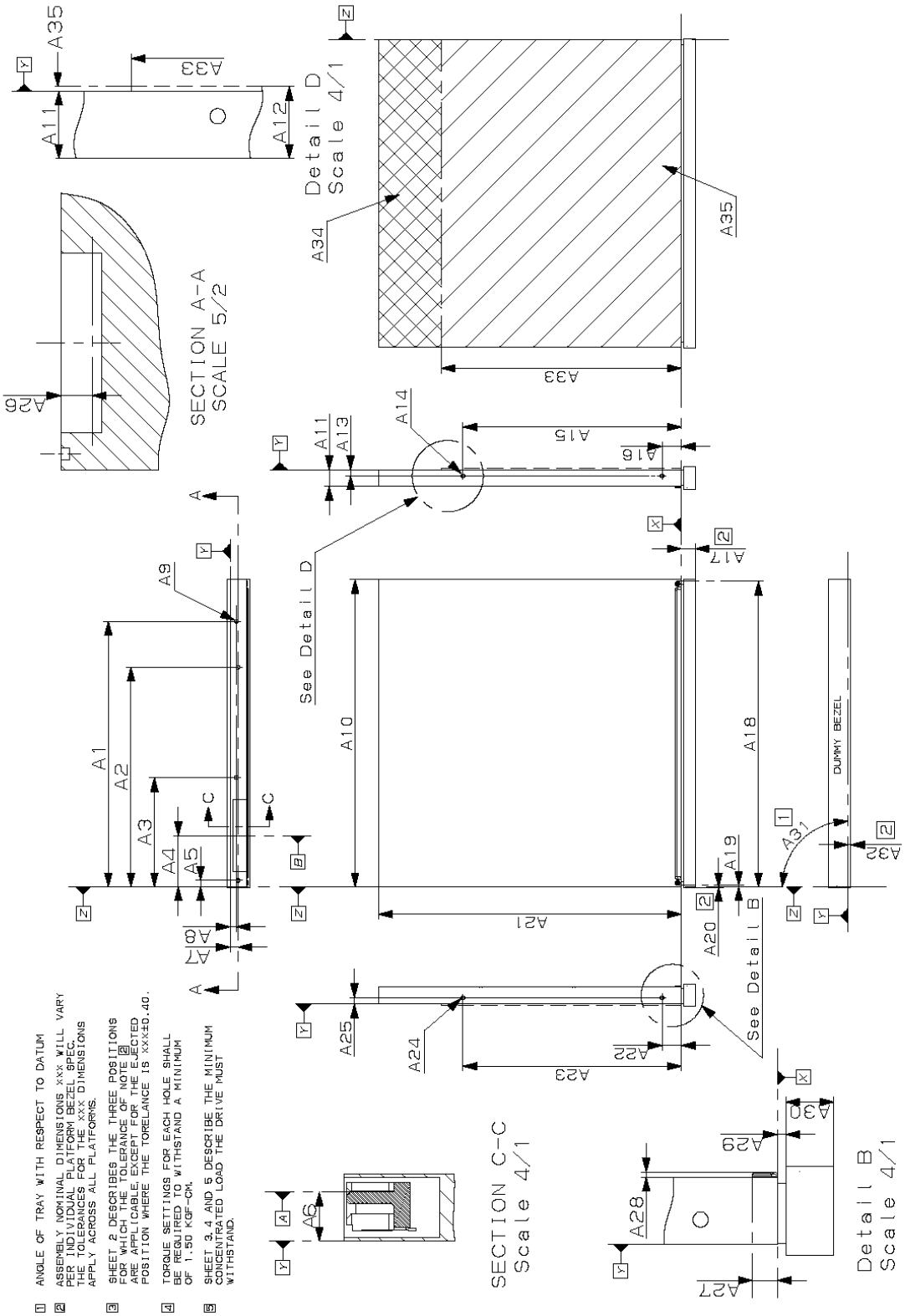


Figure 5-1: Sheet 1- 5 1/4" 7mm Height Optical Disk Drive

The three views below describe the positions where the tolerance(s) of the dimension(s) from the table are applicable, except for the ejected position where the tolerance for the dimension changes to ±0.4mm.

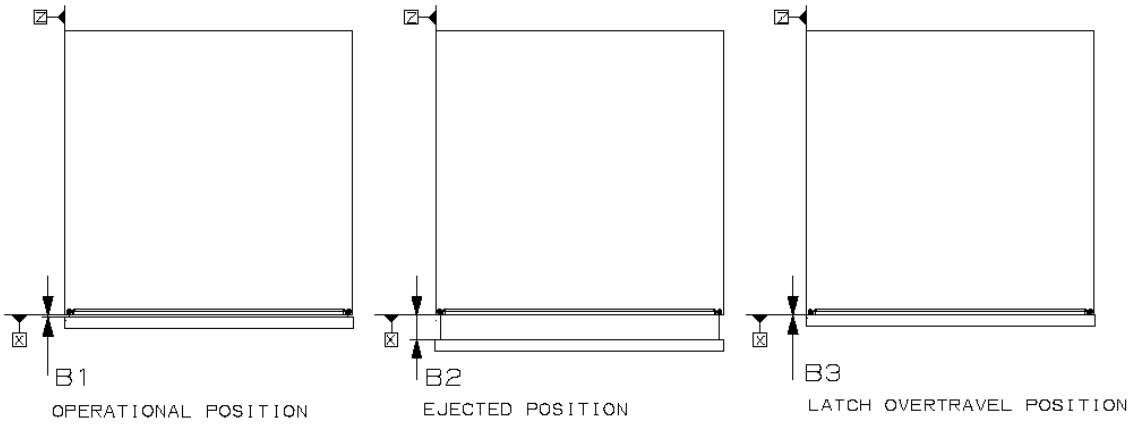
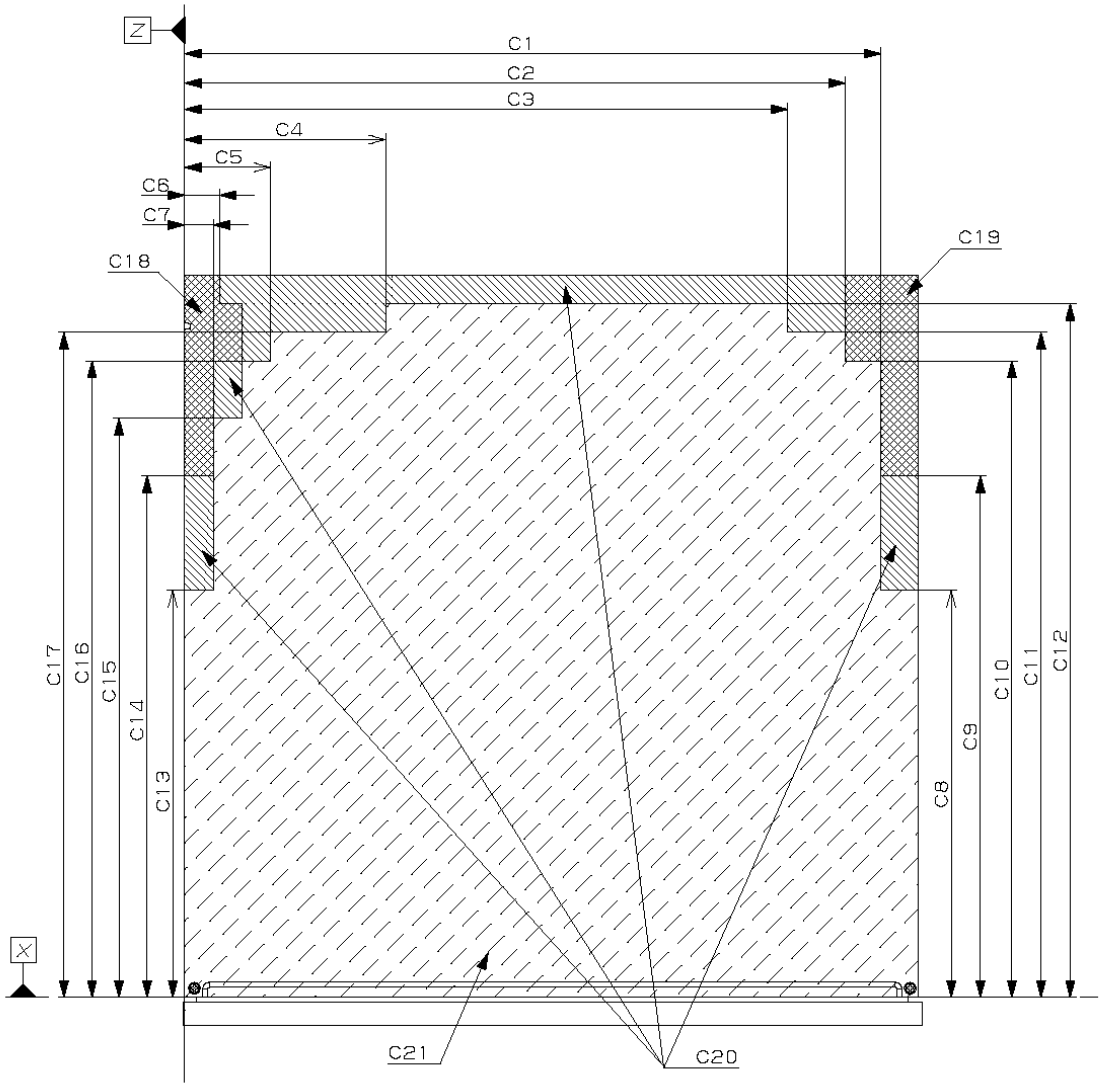
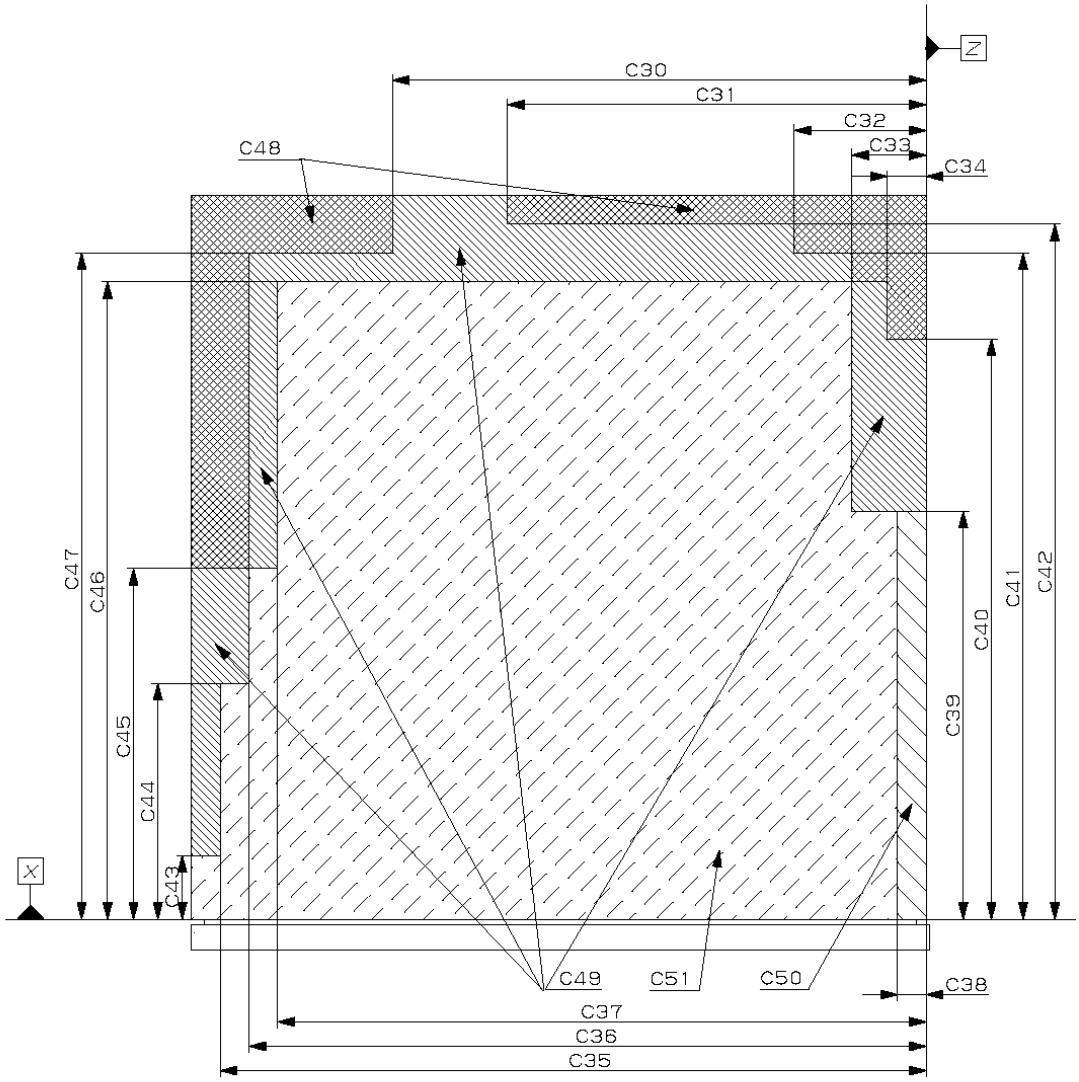


Figure 5-2: Sheet 2- Tray Positions



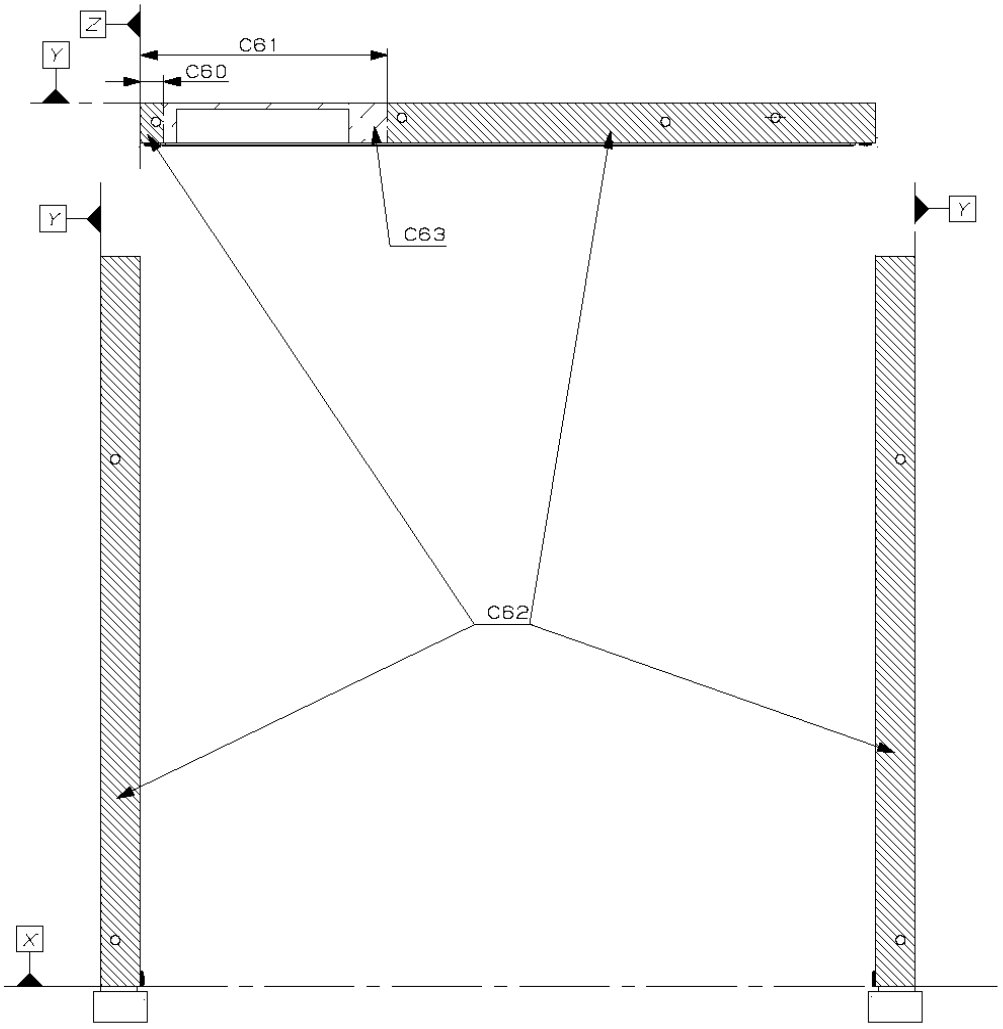
Minimum concentrated loads the drive must be able to withstand. See table for value.

Figure 5-3: Sheet 3- Loading Specifications (Top Surface)



Minimum concentrated loads the drive must be able to withstand. See table for value.

Figure 5-4: Sheet 4- Loading Specifications (Bottom Surface)



Minimum concentrated loads the drive must be able to withstand. See table for value.

Figure 5-5: Sheet 5- Loading Specifications (Side Surface)

Table 5-1: Required Dimensions for 5 1/4” 7mm Height Optical Drive SATA Form Factor

Designator	Dimension (mm)	Tolerance (mm)	Notes
A1	110.60	±.20	
A2	91.50	±.20	
A3	45.50	±.20	
A4	21.25	±.30	Distance to centerline of SATA connector Datum-B
A5	2.70	±.20	
A6	5.10	±.38	Distance to SATA connector Datum-A
A7	2X 3.30	±. 20	Distance to centerline of screw hole
A8	2X 2.60	±. 20	Distance to centerline of screw hole
A9	4X M2	Depth 1.4 Min	Min screw engagement: 1.1, Max Screw engagement 1.4, Torque settings for each hole shall be required to withstand a minimum of 1.50 KGF-CM at engagement 1.1
A10	128.00	±.20	
A11	7.00	+.50/-.20	Drive height from Datum-Y
A12	-		Drive thickness 7mm +1.0/-0.2 is made by A11 and A35. This is measured at drive body construction plate, does not include partial sheet/label.
A13	2X 2.60	±.20	
A14	2X M2	Depth 1.4 Min	Min screw engagement: 1.1, Max screw engagement 1.4, Torque settings for each hole shall be required to withstand a minimum of 1.50 KGF-CM at engagement 1.1
A15	91.00	±.20	
A16	8.00	±.20	
A17	XXX	±.30	Assembly nominal dimensions XXX may vary. The tolerances for the XXX dimensions apply across all platforms.
A18	127.50	Max	Protrusion region includes screws which are adjacent to protrusion.
A19	0.50	Min	
A20	XXX	±.30	Assembly nominal dimensions XXX may vary. The tolerances for the XXX dimensions apply across all platforms.
A21	126.10	±.20	
A22	8.00	±.20	
A23	91.00	±.20	
A24	2X M2	Depth 1.4 Min	Min screw engagement: 1.1, Max screw engagement 1.4, Torque settings for each hole shall be required to withstand a minimum of 1.50 KGF-CM
A25	2X 2.60	±.20	
A26	5.20	±.30	The insertion depth of connector inner wall.
A27	3.00	Max	
A28	1.00	Max	Protrusion
A29	0.90	±.20	
A30	2.0 Min		Recommended minimum thickness of bezel attachment. Partial thin part is available.
A31	90.0 degrees	±3.0 degrees	Angle of tray with respect to Datum Z
A32	XXX	±.30	Assembly nominal dimensions XXX may vary. The tolerances for the XXX dimensions apply across all platforms.
A33	100.00	±.30	
A34	-		Datum-Y region
A35	-	+0.5/- 0	Flatness of bottom surface except datum-Y region (A34).
B1	0.90		Assembly nominal dimensions XXX may vary. The tolerances for the XXX dimensions apply across all platforms. Figure 5-2 describes the three positions for which the tolerances are applicable, except for the ejected position where the tolerance is XXX ± 0.40.
B2	10.0 Min		
B3	0.00		

Table 5-2: Required Dimensions for 5 1/4″ 7mm Height Optical Drive SATA Form Factor

Designator	Dimension (mm)	Tolerance (mm)	Notes
C1	121.20		
C2	115.00		
C3	105.00		
C4	35.00		
C5	15.00		
C6	6.10		
C7	5.00		
C8	70.90		
C9	90.90		
C10	110.90		
C11	115.90		
C12	120.90		
C13	70.90		
C14	90.90		
C15	100.90		
C16	110.90		
C17	115.90		

Designator	Load	Unit	Notes
C18	Less than 2	Newtons	The drive is horizontally fixed with four screws on both sides. Also the drive own weight is excluded.
C19	Less than 2	Newtons	
C20	Less than 1	Newtons	
C21	0.00	Newtons	

Designator	Dimension (mm)	Tolerance (mm)	Notes
C30	93.00		
C31	73.00		
C32	23.00		
C33	13.00		
C34	6.80		
C35	123.00		
C36	118.00		
C37	113.00		
C38	5.00		
C39	71.10		
C40	101.10		
C41	116.10		
C42	121.10		
C43	11.10		
C44	41.10		
C45	61.10		
C46	111.10		
C47	116.10		

Designator	Load	Unit	Notes
C48	Less than 2	Newtons	The drive is horizontally fixed with four screws on both sides as normal operational position. Also the drive own weight is excluded.
C49	Less than 1	Newtons	
C50	Less than 0.50	Newtons	
C51	0.00	Newtons	

Designator	Dimension (mm)	Tolerance (mm)	Notes
C60	4.00		
C61	43.00		

Designator	Load	Unit	Notes
C62	Less than 1	Newtons	In the case of side load measurement, the drive is horizontally fixed with two screws on the opposite side and the drive bottom surface is supported. In the case of back load measurement, the drive is horizontally fixed with four screws on both sides.
C63	0.00	Newtons	