SFF Committee

SFF-8120

Specification for

1.8" Form Factor (78x54mm)

Standardized as EIA 676:2006 at Rev 2.6 dated August 31, 2001

This specification was submitted as a project to the Electronic Industries Alliance, and was Expired at that time.

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

This specification was developed by the SFF Committee prior to it becoming the SFF TA (Technology Affiliate) TWG (Technical Working Group) of SNIA (Storage Networking Industry Association).

The information below should be used instead of the equivalent herein.

POINTS OF CONTACT:

Chairman SFF TA TWG
Email: SFF-Chair@snia.org

If you are interested in participating in the activities of the SFF TWG, the membership application 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 can be found at:
http://www.snia.org/sff/specifications/SFF-8000.TXT

The operations which complement the SNIA's TWG Policies & Procedures to guide the SFF TWG can be found at:
http://www.snia.org/sff/specifications/SFF-8032.PDF

Suggestions for improvement of this specification will be welcome, they should be submitted to:
http://www.snia.org/feedback
SFF Committee documentation may be purchased in hard copy or electronic form. SFF Committee documents are available at ftp://ftp.t13.org/unafiliated/sff

**SFF Committee**

SFF-8120 Specification for

**Parallel 1.8” drive form factor (78x54mm)**

Rev 2.6  August 31, 2001

Secretariat:  SFF Committee

Abstract:  This document defines the dimensions for 1.8” magnetic disk drives which have a parallel interface and operate at 3.3V.

This document provides a common specification for systems manufacturers, system integrators, and suppliers of magnetic disk drives. This is an internal working document of the SFF Committee, an industry ad hoc group.

This document 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.

The description of a connector in this document 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 document is supported by the identified member companies of the SFF Committee.

Documentation:  This document has been prepared in a similar style to that of the ISO (International Organization of Standards).

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EXPRESSION OF SUPPORT BY MANUFACTURERS

The following member companies of the SFF Committee voted in favor of this industry specification.

DDK Fujikura
EMC
ENDL
FCI/Berg
Hitachi Cable
IBM
Maxtor
Seagate
Toshiba America
Tyco AMP

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

Circuit Assembly
Compaq
Fujitsu CPA
Intel
Molex
Picolight
Unisys

To save space for SFF Specifications being reviewed, the information on the principles of the SFF Committee and how to join has not been printed.
SFF Committee --

Parallel 1.8" drive form factor (78x54mm)

1. Scope

The 81xx suite of specifications defines the configuration characteristics associated with 1.8" disk drives.

The purpose of the 81xx 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-8111 defines a 60x70mm 1.8" form factor drive with a parallel interface operating at 5V
- SFF-8120 defines a 78x54mm 1.8" form factor drive with a parallel interface operating at 3.3V

In an effort to broaden the applications for storage devices, an ad hoc industry group of companies representing system integrators, peripheral suppliers, and component suppliers decided to address the issues involved.

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 begins the specification

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 this Specification.

- T13/D1321 ATA-5 ATA/ATAPI-5
- T13/D1410 ATA-6 ATA/ATAPI-6

2.2 SFF Specifications

There are several projects active within the SFF Committee. At the date of printing document numbers had been assigned to the following projects. The status of Specifications is dependent on committee activities.

F = Forwarded The document has been approved by the members for forwarding to a formal standards body.

P = Published The document has been balloted by members and is available as a published SFF Specification.

A = Approved The document has been approved by ballot of the members and is in preparation as an SFF Specification.

C = Canceled The project was canceled, and no Specification was Published.

D = Development The document is under development at SFF.

E = Expired The document has been published as an SFF
Specification, and the members voted against re-publishing it when it came up for annual review.

e = electronic  Used as a suffix to indicate an SFF Specification which has Expired but is still available in electronic form from SFF e.g. a specification has been incorporated into a draft or published standard which is only available in hard copy.

i = Information  The document has no SFF project activity in progress, but it defines features in developing industry standards. The document was provided by a company, editor of an accredited standard in development, or an individual. It is provided for broad review (comments to the author are encouraged).

s = submitted  The document is a proposal to the members for consideration to become an SFF Specification.

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2.3 Sources

Copies of ANSI standards or proposed ANSI standards may be purchased from Global Engineering.

15 Inverness Way East 800-854-7179 or 303-792-2181
Englewood 303-792-2192Fx
CO 80112-5704

Copies of SFF Specifications are available by joining the SFF Committee as an Observer or Member.

14426 Black Walnut Ct 408-867-6630x303
Saratoga 408-867-2115Fx
CA 95070 FaxAccess: 408-741-1600

The increasing size of SFF Specifications has made FaxAccess impractical to obtain large documents. Document subscribers and members are automatically updated every two months with the latest specifications. Specifications are available by FTP at ftp.t13.org/Unaffiliated/sff

Electronic copies of documents are also made available via CD_Access, a service which provides copies of all the specifications plus SFF reflector traffic. CDs are mailed every 2 months as part of the document service, and provide the letter ballot and paper copies of what was distributed at the meeting as well as the meeting minutes.
ELECTRONIC COPIES

The status of SFF Specifications is summarized in SFF-8000, which is the only specification which can now be obtained over FaxAccess.

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Saratoga CA 95070     250-1752@mcimail.com
Transfers to Bank of America: 04743 00743

Document subscribers and members are automatically updated every two months with the latest specifications. Specifications are also available by FTP at ftp.t13.org/unaffiliated/sff
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.

4. 1.8” Disk Drive Physical Configuration

4.1 Cooling Airflow

Except at the attachment area, 0.75mm clearance around the drive is recommended for cooling airflow.

4.2 Physical Dimensions

This document contains the general drive dimensional information that applies to the 1.8” disk drives.

The drive shall be measured at 20 +/- 2 degrees C. The drive shall not be exposed to any conditions (transit temperatures, shock, etc.) beyond the manufacturer’s specified limits before measurement.

5. Mounting Considerations

Mounting area is shown in Figure 7-1.

1.8” drive shall be guided or fixed by the interconnect or mounting area.

6. Power and Grounding

6.1 Power

The drive receives DC power through the same connector that contains the signal lines. Pin assignments for power and ground may be found in Figure 7-3 and Table 7-3.

6.2 Grounding

Provision for tying the DC logic ground and the chassis ground together or for separating these two grounds is vendor specific. Agreeable locations of the chassis ground are shown in Figure 7-1.

7. 1.8” disk drive Form Factor

Figure 7-1 and Table 7-1 define the dimensions for one of the 1.8” disk drive form factors.

Figure 7-2 and Table 7-2 define the dimensions for the connector for the 1.8” disk drive defined in this SFF-8120 and shows relationships among the dimensions. Dimensions shown do not include warpage allowances.

Figure 7-3 and Table 7-3 define the pin assignment in the connector for the 1.8” disk drive defined in this SFF-8120.

8. Host Connector for 1.8” disk drives

DDK Ltd. part number MCD-D50PA-X or equivalent. Figure 8-1 and Table 8-1 define the dimensions for the host connector for the 1.8” disk drive defined in this SFF-8120.
FIGURE 7-1

Note

- : Interconnect or Mounting Area
- & : Grounding Area

FIGURE 7-1
TABLE 7-1

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<td>0.138</td>
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<tr>
<td>A5</td>
<td>0.2</td>
<td>0.008</td>
</tr>
<tr>
<td>A6</td>
<td>*1.5</td>
<td>*0.059</td>
</tr>
<tr>
<td>A7</td>
<td>*1.5</td>
<td>*0.059</td>
</tr>
<tr>
<td>A8</td>
<td>3.3</td>
<td>0.130</td>
</tr>
<tr>
<td>A9</td>
<td>0.15</td>
<td>0.006</td>
</tr>
<tr>
<td>A10</td>
<td>5 or 8</td>
<td>0.197 or 0.315</td>
</tr>
<tr>
<td>A11</td>
<td>0.15</td>
<td>0.006</td>
</tr>
<tr>
<td>A12</td>
<td>54</td>
<td>2.126</td>
</tr>
<tr>
<td>A13</td>
<td>0.2</td>
<td>0.008</td>
</tr>
<tr>
<td>A14</td>
<td>40</td>
<td>1.575</td>
</tr>
<tr>
<td>A15</td>
<td>0.2</td>
<td>0.008</td>
</tr>
<tr>
<td>A16</td>
<td>0.85</td>
<td>0.033</td>
</tr>
<tr>
<td>A17</td>
<td>0.2</td>
<td>0.008</td>
</tr>
<tr>
<td>A18</td>
<td>1.65</td>
<td>0.065</td>
</tr>
<tr>
<td>A19</td>
<td>0.1</td>
<td>0.004</td>
</tr>
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</table>

* : Minimum Dimension

Warpage Dimensions
Interconnect Area: Width (short side) 0.15mm max/Length(long side) 0.35mm max
Substrate Area: 5.35 or 8.35mm max (device thickness including warpage)
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Millimeters</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
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<td>A1</td>
<td>2.1</td>
<td>0.083</td>
</tr>
<tr>
<td>A2</td>
<td>0.05</td>
<td>0.002</td>
</tr>
<tr>
<td>A3</td>
<td>2.5</td>
<td>0.098</td>
</tr>
<tr>
<td>A4</td>
<td>0.1</td>
<td>0.004</td>
</tr>
<tr>
<td>A5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A6</td>
<td>1.5</td>
<td>0.059</td>
</tr>
<tr>
<td>A7</td>
<td>0.1</td>
<td>0.004</td>
</tr>
<tr>
<td>A8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A9</td>
<td>3.5</td>
<td>0.138</td>
</tr>
<tr>
<td>A10</td>
<td>0.2</td>
<td>0.008</td>
</tr>
<tr>
<td>A11</td>
<td>1.27</td>
<td>0.050</td>
</tr>
<tr>
<td>A12</td>
<td>0.15</td>
<td>0.006</td>
</tr>
<tr>
<td>A13</td>
<td>3.3</td>
<td>0.130</td>
</tr>
<tr>
<td>A14</td>
<td>0.15</td>
<td>0.006</td>
</tr>
<tr>
<td>A15</td>
<td>5 or 8</td>
<td>0.197 or 0.315</td>
</tr>
<tr>
<td>A16</td>
<td>0.15</td>
<td>0.006</td>
</tr>
<tr>
<td>A17</td>
<td>54</td>
<td>2.126</td>
</tr>
<tr>
<td>A18</td>
<td>0.2</td>
<td>0.008</td>
</tr>
<tr>
<td>A19</td>
<td>40</td>
<td>1.575</td>
</tr>
<tr>
<td>A20</td>
<td>0.2</td>
<td>0.008</td>
</tr>
<tr>
<td>A21</td>
<td>36.7</td>
<td>1.445</td>
</tr>
<tr>
<td>A22</td>
<td>0.15</td>
<td>0.006</td>
</tr>
<tr>
<td>A23</td>
<td>30.48</td>
<td>1.200</td>
</tr>
<tr>
<td>A24</td>
<td>0.15</td>
<td>0.006</td>
</tr>
<tr>
<td>A25</td>
<td>0.85</td>
<td>0.033</td>
</tr>
<tr>
<td>A26</td>
<td>0.2</td>
<td>0.008</td>
</tr>
<tr>
<td>A27</td>
<td>1.65</td>
<td>0.065</td>
</tr>
<tr>
<td>A28</td>
<td>0.1</td>
<td>0.004</td>
</tr>
</tbody>
</table>
Table 7-3

<table>
<thead>
<tr>
<th>PIN No.</th>
<th>SIGNALS</th>
<th>PIN No.</th>
<th>SIGNALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RESET-</td>
<td>2</td>
<td>GROUND</td>
</tr>
<tr>
<td>3</td>
<td>DD 7</td>
<td>4</td>
<td>DD 8</td>
</tr>
<tr>
<td>5</td>
<td>DD 6</td>
<td>6</td>
<td>DD 9</td>
</tr>
<tr>
<td>7</td>
<td>DD 5</td>
<td>8</td>
<td>DD 10</td>
</tr>
<tr>
<td>9</td>
<td>DD 4</td>
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<td>DD 11</td>
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<td>11</td>
<td>DD 3</td>
<td>12</td>
<td>DD 12</td>
</tr>
<tr>
<td>13</td>
<td>DD 2</td>
<td>14</td>
<td>DD 13</td>
</tr>
<tr>
<td>15</td>
<td>DD 1</td>
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<td>DD 0</td>
<td>18</td>
<td>DD 15</td>
</tr>
<tr>
<td>19</td>
<td>GROUND</td>
<td>20</td>
<td>OPEN</td>
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<tr>
<td>21</td>
<td>DMARQ</td>
<td>22</td>
<td>GROUND</td>
</tr>
<tr>
<td>23</td>
<td>-DIOW/STOP</td>
<td>24</td>
<td>GROUND</td>
</tr>
<tr>
<td>25</td>
<td>-DIOR/HDMARDY/HSTROBE</td>
<td>26</td>
<td>GROUND</td>
</tr>
<tr>
<td>27</td>
<td>IORDY/DDMARDY/-DSTROBE</td>
<td>28</td>
<td>CSEL</td>
</tr>
<tr>
<td>29</td>
<td>DMACK-</td>
<td>30</td>
<td>GROUND</td>
</tr>
<tr>
<td>31</td>
<td>INTRQ</td>
<td>32</td>
<td>IOCS16-</td>
</tr>
<tr>
<td>33</td>
<td>DA 1</td>
<td>34</td>
<td>PDIAG-/CBLID-</td>
</tr>
<tr>
<td>35</td>
<td>DA 0</td>
<td>36</td>
<td>DA 2</td>
</tr>
<tr>
<td>37</td>
<td>CS0-</td>
<td>38</td>
<td>CS1-</td>
</tr>
<tr>
<td>39</td>
<td>DASP-</td>
<td>40</td>
<td>GROUND</td>
</tr>
<tr>
<td>41</td>
<td>+3.3V (LOGIC)</td>
<td>42</td>
<td>+3.3V (MOTOR)</td>
</tr>
<tr>
<td>43</td>
<td>GROUND</td>
<td>44</td>
<td>RESERVED</td>
</tr>
</tbody>
</table>

Note: Symbol (-) in front of signal name shows negative logic.

Some devices may utilize pins A, B, C and D for option selection. If a device uses pins A, B, C and D for device selection, when no jumper is present, the device should be designated as Device 0. When a jumper is present between pins C and D, the device should be designated as Device 1. When a jumper is present between pins B and D, the Parallel 1.8” Drive Form Factor (78x54mm)
device should respond to the CSEL signal to determine the device number.

FIGURE 8-1
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Millimeters</th>
<th>Inches</th>
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</thead>
<tbody>
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<td>4.31</td>
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<tr>
<td>A2</td>
<td>1.9</td>
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</tr>
<tr>
<td>A3</td>
<td>0.05</td>
<td>0.002</td>
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<tr>
<td>A4</td>
<td>0.635</td>
<td>0.025</td>
</tr>
<tr>
<td>A5</td>
<td>6.92</td>
<td>0.272</td>
</tr>
<tr>
<td>A6</td>
<td>1.27</td>
<td>0.050</td>
</tr>
<tr>
<td>A7</td>
<td>36.7</td>
<td>1.445</td>
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<tr>
<td>A8</td>
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<td>0.004</td>
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<td>A9</td>
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<td>0.091</td>
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<td>0</td>
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<tr>
<td>A16</td>
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<td>0.004</td>
</tr>
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<td>3.5</td>
<td>0.138</td>
</tr>
<tr>
<td>A18</td>
<td>1.27</td>
<td>0.050</td>
</tr>
<tr>
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<td>0.024</td>
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<tr>
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<td>#0.018</td>
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<tr>
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<td>0.44</td>
<td>0.017</td>
</tr>
<tr>
<td>A22</td>
<td>0.02</td>
<td>0.001</td>
</tr>
<tr>
<td>A23</td>
<td>*110 (degree)</td>
<td>*110 (degree)</td>
</tr>
</tbody>
</table>

* = Minimum Dimension    # = Maximum Dimension