SNIA™
SFF TWG
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REF-TA-1011

Reference Guide for

Cross Reference to Select SFF Connectors and Modules

Rev 1.1.3~~1~~ July 9~~April 1~~, 2024

SECRETARIAT: SFF TA TWG

This reference guide is made available for public review at http://www.snia.org/sff/specifications. Comments may be submitted at http://www.snia.org/feedback. Comments received will be considered for inclusion in future revisions of this document.

The descriptions of any of the connectors in this reference guide do not assure that any specific component is available from one or more connector suppliers. If such a connector is supplied, it must comply with its respective specifications referenced in this guide to achieve interoperability between suppliers.

ABSTRACT: This reference guide defines the naming conventions for the various configurations of pluggable I/O solutions.

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Foreword

The development work on this document was done by the SNIA SFF TA 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.

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

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

Change History

Rev 1.0 *September 12, 2018*

- Original content was taken from Section 3 of SFF-8024
- Table content updated to reflect current document status per July 2018

Rev 1.1 *October 1, 2019*

- Added SAS-4.1 references where applicable
- Add references for SFF-8431 and SFF-8639
- Table 4-1 entry for SFP changed to include "Superseded by SFP+ (see below)"
- Table 4-1 entry for SFP+ changed to "SFF-8431 (Archived) → Superseded by SFP10"Added SFP56 and QSFP56 (Styles A & B) to Table 4-1 and added a note
- Added SFF-8639 to Table 4-3
- Minor formatting and editorial changes

Rev 1.1.3 *July 9, 2024*

- Added SFP112, SFP224, QSFP112, QSFP224 to Table 4-1
- Added stacked QSFP to Figure 3-2 drawing
- Added Pluggable Module Device Connector table for SFP, QSFP with IEEE, OIF, Fibre Channel, InfiniBand

CONTENTS

FIGURES

TABLES

1. Scope

This document provides a cross reference between the names of connectors and pluggable modules and the SFF specifications which define them.

2. References and Conventions

2.1 Industry Documents

- INCITS 417 SAS-1.1 (Serial Attached SCSI – 1.1)
- INCITS 478 SAS-2.1 (Serial Attached SCSI – 2.1)
- INCITS 519 SAS-3 (Serial Attached SCSI - 3)
- INCITS 534 SAS-4 (Serial Attached SCSI - 4)
- INCITS 567 SAS-4.1 (Serial Attached SCSI – 4.1)
- InfiniBand Architecture Specification Volume 2
- SFF-8071 SFP+ 1X 0.8mm Card Edge Connector
- INF-8074 Small Formfactor Pluggable (SFP) Transceiver
- INF-8077 XFP 1X 10 Gb/s Pluggable Module
- SFF-8418 SFP+ 10 Gb/s Electrical Interface
- SFF-8419 SFP+ Power and Low Speed Interface
- SFF-8431 Enhanced Small Form Factor Pluggable Module SFP+
- SFF-8432 SFP+ Module and Cage
- SFF-8433 SFP+ Ganged Cage
- SFF-8436 QSFP+ 4X 10 Gb/s Pluggable Transceiver
- INF-8438 QSFP 4X 4 Gb/s Transceiver (Quad SFP)
- SFF-8449 Management Interface for SAS Shielded Cables
- SFF-8472 Management Interface for SFP+
- SFF-8482 Serial Attachment 2X Unshielded Connector
- SFF-8613 Mini Multilane 4/8X Unshielded Connector (HDun)
- SFF-8614 Mini Multilane 4/8X Shielded Cage/Connector (HDsh)
- SFF-8617 Mini Multilane 12X Shielded Cage/Connector (CXP)
- SFF-8630 Serial Attachment 4X Unshielded Connector
- SFF-8636 Management Interface for 4-lane Modules and Cables
- SFF-8639 Multifunction 6X Unshielded Connector
- SFF-8642 Mini Multilane 12X 10 Gb/s Shielded Connector (CXP10)
- SFF-8661 QSFP+ 4X Pluggable Module
- SFF-8662 QSFP+ 4X Connector (Style A)
- SFF-8663 QSFP+ Cage (Style A)
- SFF-8672 QSFP+ 4X Connector (Style B)
- SFF-8679 QSFP+ 4X Base Electrical Specification
- SFF-8680 Serial Attachment 2X 12 Gb/s Unshielded Connector
- SFF-8682 QSFP+ 4X Connector
- SFF-8683 QSFP+ Cage

2.2 Sources

The complete list of SFF documents which have been completed, are currently being worked on, or that have been expired by the SFF Committee 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.

Copies of SAS standards may be obtained from the International Committee for Information Technology Standards (INCITS) (http://www.incits.org).

Copies of InfiniBand standards may be obtained from the InfiniBand Trade Association (IBTA) (http://www.infinibandta.org).

2.3 Conventions

The following conventions are used throughout this document:

~~DEFINTIONS~~DEFINITIONS

Certain words and terms used in this standard have a specific meaning beyond the normal English meaning. These words and terms are defined either in the definitions or in the text where they first appear.

ORDER OF ~~PRECENDENCE~~PRECEDENCE

If a conflict arises between text, tables, or figures, the order of precedence to resolve the conflicts is text; then tables; and finally figures. Not all tables or figures are fully described in the text. Tables show data format and values.

3. Definitions

For the purposes of this document, the following definitions apply:

Dual-Card Connector: Connectors in which all receptacle contacts mate to one of two PCBs per port on the module side of the interface.

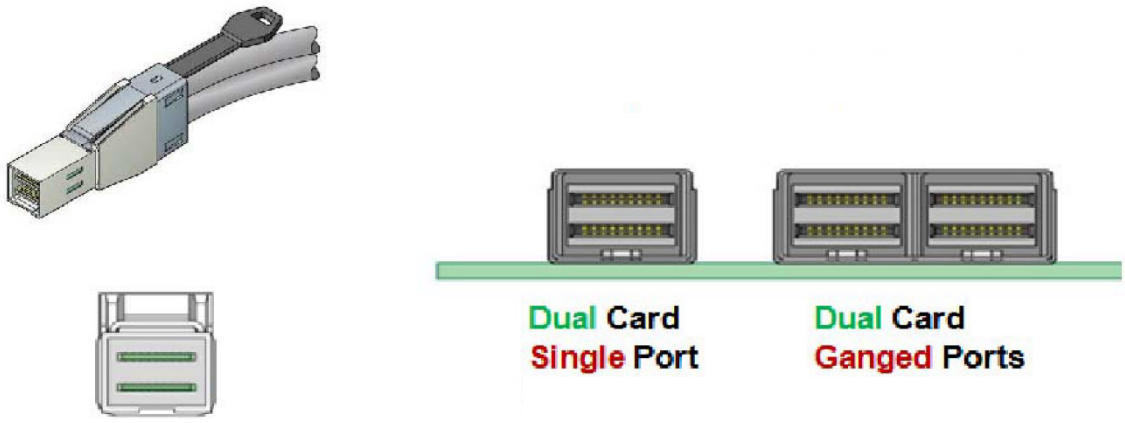
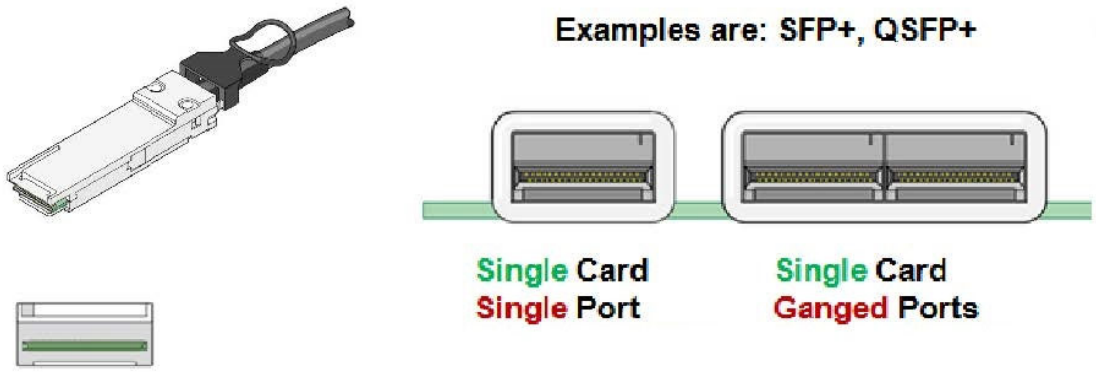


FIGURE 3-1 DUAL CARD CONNECTOR

Single-Card Connector: Connectors in which all receptacle contacts mate to a single PCB on the module side of the interface.



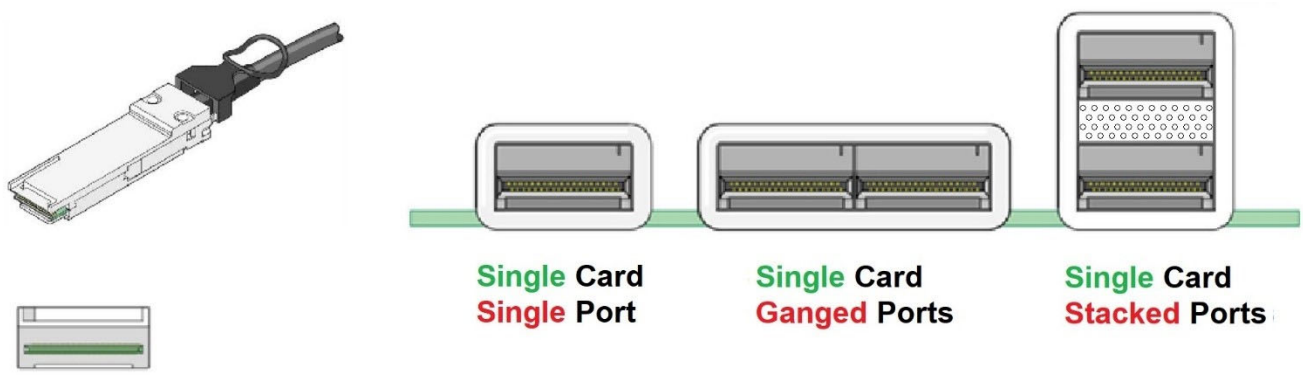


FIGURE 3-2 SINGLE CARD CONNECTOR

4. Specifications Related to Select Form Factors

Table 4-1 and Table 4-2 list the relevant SFF specifications for select form factors. Please note that in Table 4-1 and Table 4-2, the gray color denotes expired or superseded SFF documents. See SFF-8024 Module Management Reference Codes for the Transceiver Identifier values, Connector types, Extended Specification Compliance Codes, Host Electrical Interface IDs, Media Interface IDs and Transceiver Sub-type codes. For the QSFP family, see also SFF-8665.

TABLE 4-1 SINGLE-CARD PLUGGABLE MODULES AND I/O CONNECTORS

<table>
<tr><th rowspan="2"></th><th colspan="4">Mechanical</th><th rowspan="2">Low Speed & General Electrical</th><th rowspan="2">Management Interface</th></tr>
<tr><th>Module</th><th>Connector</th><th>Single Port Cage</th><th>~~Ganged~~ Stacked Port Cage</th></tr>
<tr><td>SFP</td><td colspan="6">INF-8074 → Superseded by SFP+ (see below)</td></tr>
<tr><td>SFP+</td><td colspan="6">SFF-8431 (Archived) → Superseded by SFP10</td></tr>
<tr><td>SFP10</td><td rowspan="3">SFF-8432</td><td rowspan="3">SFF-8071</td><td rowspan="3">SFF-8432 Single Port, SFF-8433 Ganged Port</td><td rowspan="3"></td><td>SFF-8418 & SFF-8419</td><td rowspan="2">SFF-8472</td></tr>
<tr><td>SFP16, SFP28, & SFP56</td><td rowspan="2">SFF-8419</td></tr>
<tr><td>SFP56</td><td>SFF-8472 or CMIS</td></tr>
<tr><td>SFP112</td><td colspan="3">SFF-TA-1031</td><td></td><td>SFF-8419</td><td>CMIS</td></tr>
<tr><td>SFP224</td><td colspan="3"></td><td></td><td></td><td>CMIS</td></tr>
<tr><td>XFP</td><td colspan="6">INF-8077</td></tr>
<tr><td>QSFP</td><td colspan="6">INF-8438 → Superseded by QSFP+ (see below)</td></tr>
<tr><td>QSFP+</td><td colspan="6">SFF-8436 (Expired) → Superseded by QSFP10 (see below)</td></tr>
<tr><td>QSFP10 & QSFP14</td><td rowspan="3">SFF-8661</td><td>SFF-8682</td><td rowspan="2">SFF-8683</td><td rowspan="3"></td><td rowspan="3">SFF-8679</td><td rowspan="3">SFF-8636 or CMIS</td></tr>
<tr><td>QSFP28 & QSFP56 ~~(SFF-8665)~~</td><td>SFF-8672 Style B*</td></tr>
<tr><td>SFF-8662 Style A* Single Port
SFF-TA-1029 Style C Cabled</td><td>SFF-8663 Style A*
SFF-TA-1029 Style C Cabled</td></tr>
<tr><td>~~QSFP56 (Move to QSFP28)~~</td><td colspan="3">~~Copy down QSFP28 specs~~</td><td></td><td></td><td>~~SFF-8636, CMIS~~</td></tr>
<tr><td>QSFP112</td><td colspan="3">SFF-TA-1027</td><td>SFF-TA-1027</td><td>SFF-8679</td><td>CMIS</td></tr>
<tr><td>QSFP224</td><td colspan="3">SFF-TA-1027</td><td></td><td>SFF-8679</td><td>CMIS</td></tr>
</table>

*Both Style 'A' and Style 'B' are suitable for 28 GBd (including PAM4 use, up to 56 Gbps on each lane) ~~and may be suitable for 56 GBd (including PAM4 use, up to 112 Gbps on each lane)~~ applications.

TABLE 4-2 DUAL-CARD PLUGGABLE MODULES AND I/O CONNECTORS

	Mechanical				Low Speed & General Electrical	Management Interface
	Module	Connector	Single Port Cage	Ganged Port Cage		
CXP10	SFF-8642 (Expired)→ Superseded by CXP14 (see below)				IBTA QDR	N/A
CXP14	SFF-8617				IBTA FDR	
CXP28					IBTA EDR	
HD12un	SFF-8613~~(Extend to ganged port) NA~~				SAS-2.1/SAS-3	SFF-8636 & SFF-8449
HD24un					SAS-4/SAS-4.1	
HD12sh	SFF-8614~~(Extend to ganged port) NA~~				SAS-2.1/SAS-3	SFF-8636 & SFF-8449
HD24sh					SAS-4/SAS-4.1	

TABLE 4-3 EDGE CARD DEVICE CONNECTORS

Connector	Application	No. of ports
SFF-8482	SAS 1.1 SAS-2.1 SAS-4/SAS-4.1	2
SFF-8680	SAS-3	
SFF-8630	SAS-3 SAS-4/SAS-4.1	4
SFF-8639	8 GT/s PCIe 16 GT/s PCIe SAS-3 SAS-4/ SAS-4.1	

TABLE 4-4 PLUGGABLE MODULE DEVICE CONNECTORS

Connector	Application	No. of ports
SFF-TA-1031~~SFF-TA-1027~~	IEEE 50GBASE-CR1; 100GBASE-CR1,2,4 Fibre Channel PI-7,8 OIF CEI28G-VSR, OIF CEI56G-VSR, OIF CEI112G-VSR InfiniBand HDR, NDR~~IEEE 100GBASE-CR1,2,4; 200GBASE-CR2,4; 400GBASE-CR4; 100GAUI-1,2,4 C2M; 200GAUI-2,4 C2M; 400GAUI-4 C2M Fibre Channel PI-7,8 OIF CEI112G-VSR Infiniband HDR, NDR~~	14
SFF-TA-1027	IEEE 100GBASE-CR1,2,4; 200GBASE-CR2,4; 400GBASE-CR4; 100GAUI-1,2,4 C2M; 200GAUI-2,4 C2M; 400GAUI-4 C2M Fibre Channel PI-7,8 OIF CEI28G-VSR, OIF CEI56G-VSR, OIF CEI112G-VSR InfiniBand HDR, NDR	4
~~SFF-TA-1031~~	~~IEEE 50GBASE-CR1; 100GBASE-CR1,2,4 Fibre Channel PI-7,8 OIF CEI112G-VSR Infiniband HDR, NDR~~	~~1~~