REF-TA-1011

Reference Guide for

Cross Reference to Selected SFF Connectors and Modules

Rev 1.1.~~.76~~ ~~April 21~~July 11, 2025

SECRETARIAT: SFF TWG
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This document has been released by SNIA. The SFF TWG believes that the ideas, methodologies, and technologies described in this document are technically accurate and are appropriate for widespread distribution.

The description ~~of the connector~~ in this specification does not assure that the specific component is available from ~~connector~~ suppliers. If such a ~~connector~~ component is supplied, it should comply with this specification 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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- ~~Results of IP Disclosures: http://www.snia.org/sffdisclosures~~
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Foreword

The development work on this document was done by the SNIA SFF TWG, an industry group. Since its formation as the SFF Committee in August 1990, as well as since SFF's transition to SNIA in 2016, 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 ÷

https://www.snia.org/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- Table 4-1~~Table 4-1~~~~Table 4-1~~ entry for SFP changed to include "Superseded by SFP+ (see below)"
- Table 4-1~~Table 4-1~~~~Table 4-1~~ entry for SFP+ changed to "SFF-8431 (Archived) → Superseded by SFP10"Added SFP56 and QSFP56 (Styles A & B) to Table 4-1~~Table 4-1~~~~Table 4-1~~ and added a note
- Added SFF-8639 to Table 4-33~~Table 4-3~~~~Table 4-3~~
- Minor formatting and editorial changes

Rev 1.1.2

- Added SFP112, SFP224, QSFP112, QSFP224 to Table 4-1
- Added stacked QSFP drawings
- Added device connector table for SFP, QSFP with IEEE, OIF, Fibre Channel, InfiniBand

Rev 1.1.4

- Comments from ballot:
- Added references to IEEE, CMIS, SFF specs
- Modified Table 4-1
  - Added QSFP112, QSFP224
  - Added CMIS references
  - Added note allowing QSFP28 coherent modules to support CMIS
- Added SATA references to Table 4-3
- Removed SFP support for CR2, CR4

Rev 1.1.5

- Removed SFF-TA-1029 (Project cancelled)
- Added SFF-TA-1027 to QSFP28 and QSFP56 in Table 4-1

Rev 1.1.6

- Combined QSFP112 and QSFP224 rows for module, connector and cage columns
- Combined QSFP112 and QSFP224 rows for management column

Rev 1.1.7 *July 11, 2025*

- Add footnote in Table 4-1 for QSFP112 management: 'SFF-8636 can be used for passive copper cables'
- Implemented editorial comments from May 2025 ballot
- Created table for section 2.2 (Sources) and added sources for SATA and Fibre Channel
- Added 'DRAFT' watermark

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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 (alphabetize)

- IEEE Std 802.3 Standard for Ethernet
- IEEE Std 802.3ck Standard for Ethernet for 100 Gb/s electrical signaling
- 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)
- INF-8074 Small Formfactor Pluggable (SFP) Transceiver
- INF-8077 XFP 1X 10 Gb/s Pluggable Module
- INF-8438 QSFP 4X 4 Gb/s Transceiver (Quad SFP)

- InfiniBand Architecture Specification Volume 2
- OIF CMIS (Common Management Interface Specification)
- PCIe Peripheral Component Interconnect Express
- SATA Serial Advanced Technology Attachment
- SFF-TA-1027 QSFP2 Cage, Connector and Module Specification
- SFF-TA-1031 SFP2 Cage, Connector and Module Specification
- SFF-8071 SFP+ 1X 0.8mm Card Edge Connector
- 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-8665 QSFP+ 4x Pluggable Transceiver Solutions
- 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 https://www.snia.org/sff/specifications. Suggestions for improvement of this specification ~~will be~~are welcome and~~, they~~ should be submitted to https://www.snia.org/feedback.

Standard	Organization	Website
ASME	American Society of Mechanical Engineers (ASME)	https://www.asme.org
Electronic Industries Alliance (EIA)	Electronic Components Industry Association (ECIA)	https://www.ecianow.org/eia-technical-standards
IEEE	Institute of Electrical and Electronics Engineers (IEEE)	https://ieeexplore.ieee.org/browse/standards/get-program/page/series?id=68
InfiniBand	InfiniBand Trade Association (IBTA)	https://www.infinibandta.org
JEDEC	Joint Electron Deice Engineering Council (JEDEC)	https://www.jedec.org
OIF	Optical Internetworking Forum (OIF)	https://www.oiforum.com/technical-work/implementation-agreements-ias/
PCIe	PCI-SIG	https://www.pcisig.com/specifications
SAS, Fibre Channel and other ANSI standards	International Committee for Information Technology Standards (INCITS)	https://www.incits.org/standards-information/purchase-standards-or-download-dpans
SATA	Serial ATA	https://sata-io.org/developers/purchase-specification

~~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).~~

~~Copies of IEEE standards may be obtained from: https://standards.ieee.org/ieee/802.3/10422~~

~~Copies of OIF CMIS specification may be obtained from:~~

2.3 Conventions

The following conventions are used throughout this document:

DEFINTIONS

: 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:

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. Keywords, Acronyms, and Definitions

For the purposes of this document, the following keywords, acronyms, and definitions apply.

3.1 Keywords

None used

3.2 Acronyms and Abbreviations

PCB: Printed Circuit Board

~~3.~~3.3 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.

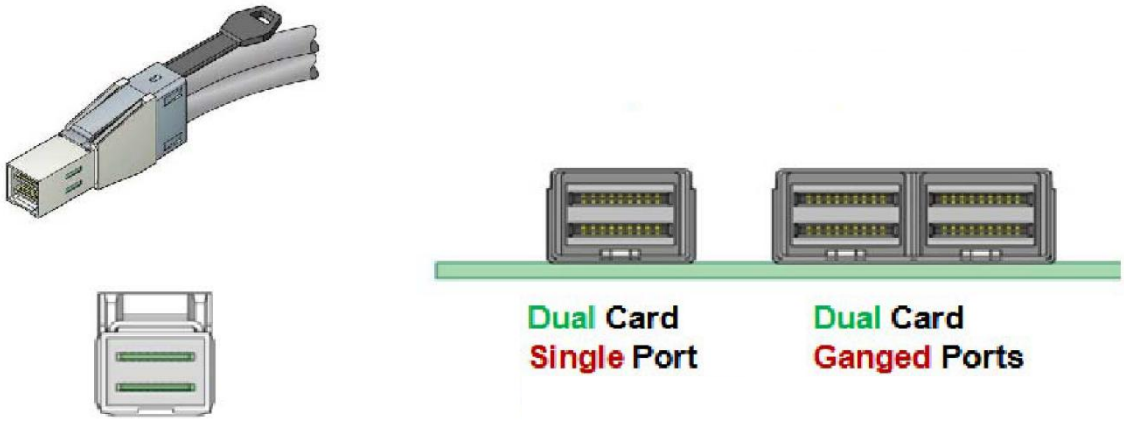

FIGURE 2-1 DUAL CARD CONNECTOR

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

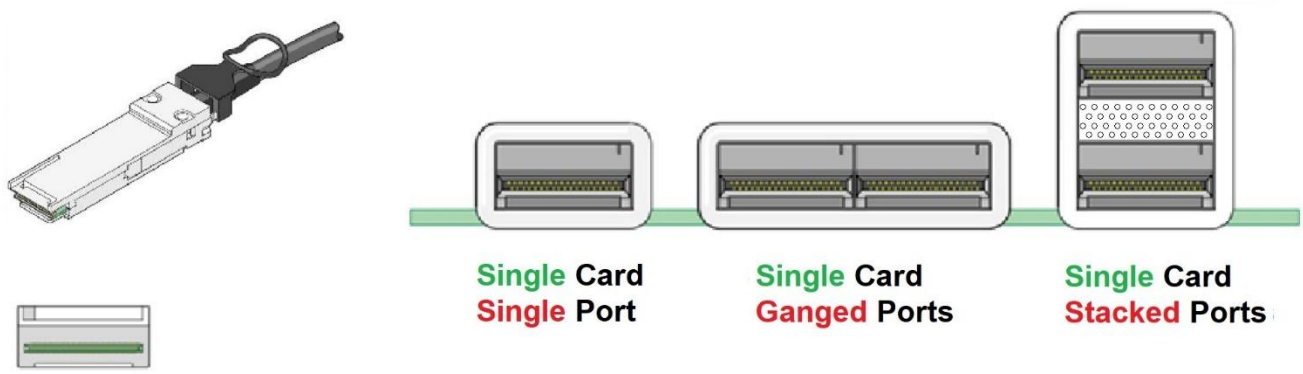

FIGURE 2-2 SINGLE CARD CONNECTOR

4. Specifications Related to Selected Pluggable Modules and I/O Connectors

Table 4-1~~Table 4-1~~~~Table 4-1~~ and Table 4-2~~Table 4-2~~~~Table 4-2~~ list the relevant SFF specifications for selected pluggable modules and I/O connectors. Please note that in Table 4-1~~Table 4-1~~~~Table 4-1~~ and Table 4-2~~Table 4-2~~~~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 for information on compatibility.**

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

<table>
<tr><th></th><th colspan="4">Mechanical</th><th rowspan="2">Low Speed & General Electrical</th><th rowspan="2">Management Interface</th></tr>
<tr><th>Colloquial Name</th><th>Module</th><th>Connector</th><th>Single Port Cage</th><th>Stacked 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="2">SFF-8432</td><td rowspan="2">SFF-8071</td><td rowspan="2">SFF-8432, single port, SFF-8433, ganged</td><td rowspan="2">—</td><td>SFF-8418 & SFF-8419</td><td rowspan="2">SFF-8472</td></tr>
<tr><td>SFP16, SFP28, & SFP56</td><td rowspan="3">SFF-8419</td></tr>
<tr><td>SFP112</td><td colspan="3">SFF-TA-1031</td><td>—</td><td rowspan="2">CMIS</td></tr>
<tr><td>SFP224</td><td colspan="3">TBD</td><td>—</td></tr>
<tr><td colspan="7"></td></tr>
<tr><td>XFP</td><td colspan="6">INF-8077</td></tr>
<tr><td colspan="7"></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="4">SFF-8661

SFF-TA-1027 Section 5.3</td><td>SFF-8682</td><td rowspan="2">SFF-8683</td><td rowspan="3">—</td><td rowspan="4">SFF-8679</td><td rowspan="3">SFF-8636**</td></tr>
<tr><td rowspan="3">QSFP28</td><td>SFF-8672 (Style B)*</td></tr>
<tr><td>SFF-8662 (Style A)~~, Single Port~~*

~~SFF-TA-1027~~</td><td>SFF-8663 (Style A)*

~~SFF-TA-1027~~</td></tr>
<tr><td>SFF-TA-1027</td><td>SFF-TA-1027</td></tr>
<tr><td>QSFP56</td><td>SFF-8672 (Style B)*</td><td>SFF-8683</td><td>—</td><td>SFF-8636 or CMIS</td></tr>
</table>

		SFF-8662 (Style A), ~~Single Port~~* ~~SFF-TA-1027~~	SFF-8663 (Style A)* ~~SFF-TA-1027~~			
		SFF-TA-1027	SFF-TA-1027			
QSFP112	SFF-TA-1027 Section 5.3	SFF-TA-1027	SFF-TA-1027	SFF-TA-1027		CMIS***
QSFP224	SFF-TA-1027 Section 6.3			—		CMIS

*Both Style 'A' and Style 'B' are suitable for 28 GBd (including PAM4 use, up to 56 Gbps on each lane) applications.
** Coherent modules may use CMIS
***SFF-8636 can be used for passive copper cables

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)				InfiniBand~~BTA~~ QDR	~~NA~~InfiniBand Volume 2, Chapter 8
CXP14	SFF-8617				InfiniBand~~BTA~~ FDR	
CXP28					InfiniBand~~BTA~~ EDR	
HD12un	SFF-8613				SAS-2.1/SAS-3	SFF-8636 & SFF-8449
HD24un	NA				SAS-4/SAS-4.1	
HD12sh	SFF-8614				SAS-2.1/SAS-3	SFF-8636 & SFF-8449
HD24sh	NA				SAS-4/SAS-4.1	

TABLE 4-~~3~~3 EDGE CARD DEVICE CONNECTORS

Connector	Application	No. of ports
SFF-8482	SAS-~~-~~1.1, 2.1, 4, 4.1 ~~SAS-2.1~~ ~~SAS-4/SAS-4.1~~ SATA	2
SFF-8680	SAS-3 SATA	
SFF-8630	SAS-3, 4, 4,1 ~~SAS-4/SAS-4.1~~	4

	SATA	
SFF-8639	8 and 16 GT/s PCIe ~~16 GT/s PCIe~~ SAS-3, 4, 4.1 ~~SAS-4/ SAS-4.1~~ SATA	

TABLE 4-4 PLUGGABLE MODULE DEVICE CONNECTORS

Connector	Form Factor	Application	No. of lanes
SFF-TA-1031	SFP	IEEE 50GBASE-CR1; 100GBASE-CR1 Fibre Channel PI-7,8 OIF CEI-28G-VSR, OIF CEI-56G-VSR, OIF CEI-112G-VSR InfiniBand HDR, NDR	1
SFF-TA-1027	QSFP	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 CEI-28G-VSR, OIF CEI-56G-VSR, OIF CEI-112G-VSR InfiniBand HDR, NDR	4