



REF-TA-1011

Reference Guide for

Cross Reference to Selected SFF Connectors and Modules

Rev 1.3

November 17, 2025

SECRETARIAT: SFF TWG

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The description in this specification does not assure that the specific component is available from suppliers. If such a 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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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 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- Table 4-1 entry for SFP changed to include "Superseded by SFP+ (see below)"
- Table 4-1 entry for SFP+ changed to "SFF-8431 (Archived) → Superseded by SFP10"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 1.2 *September 15, 2025*

- 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
- Added references to IEEE, CMIS, SFF specs
- Modified Table 4-1
 - o Added QSFP112, QSFP224
 - o Added CMIS references
 - o Added note allowing QSFP28 coherent modules to support CMIS
- Added SATA references to Table 4-3
- Removed SFP support for CR2, CR4
- Removed SFF-TA-1029 (Project cancelled)
- Added SFF-TA-1027 to QSFP28 and QSFP56 in Table 4-1
- Combined QSFP112 and QSFP224 rows for module, connector and cage columns
- Combined QSFP112 and QSFP224 rows for management column
- 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
- Split SFF-1027 into separate boxes to better indicate compatibility
- Added note to QSFP28 and QSFP56 entries in Table 4-1: Note to read: Not all module, connector, cage combinations are compatible. See SFF-8665 for details.

Rev 1.3 *November 17, 2025*

- Added acronyms to Section 3.2.
- Removed "expired", "archived", and "see below" from Tables 4-1, 4-2.
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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

- IEEE Std 802.3 Standard for Ethernet
- IEEE Std 802.3ck Standard for Ethernet for 100 Gb/s electrical signaling
- INCITS FC-PI-7 (Fibre Channel Physical Interface-7)
- INCITS FC-PI-8 (Fibre Channel Physical Interface-8)
- 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-CEI: Common Electrical I/O (CEI) – Electrical and Jitter Interoperability agreements for 6G+bps, 11G+bps, 25G+bps, 56G+bps and 112G+bps I/O
- 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
- 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 are welcome and 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 Device 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

2.3 Conventions

The following conventions are used throughout this document:

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 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. Keywords, Acronyms, and Definitions

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

3.1 Keywords

May: Indicates flexibility of choice with no implied preference.

May or may not: Indicates flexibility of choice with no implied preference.

Optional: 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. Describing a feature as optional in the text is done to assist the reader.

Prohibited: Describes a feature, function, or coded value that is defined in a referenced specification to which this SFF specification makes a reference, where the use of said feature, function, or coded value is not allowed for implementations of this specification.

Reserved: Where the term is used for a signal on a connector contact, the function is set aside for future standardization. It is not available for vendor specific use. Where this term is used for bits, bytes, fields, and code values; the bits, bytes, fields, and code values are set aside for future standardization. The default value shall be zero. The originator is required to define a Reserved field or bit as zero, but the receiver should not check Reserved fields or bits for zero.

Restricted: Refers to features, bits, bytes, words, and fields that are set aside for other standardization purposes. If the context of the specification applies to the restricted designation, then the restricted bit, byte, word, or field shall be treated as a value whose definition is not in scope of this document, and is not interpreted by this specification.

Shall: Indicates a mandatory requirement. Designers are required to implement all such mandatory requirements to ensure interoperability with other products that conform to this specification.

Should: Indicates flexibility of choice with a strongly preferred alternative.

Vendor specific: Indicates something (e.g., a bit, field, code value) that is not defined by this specification. Specification of the referenced item is determined by the manufacturer and may be used differently in various implementations.

3.2 Acronyms and Abbreviations

CXP: 100G 12 lane Pluggable
EDR: Enhanced Data Rate; 100 Gb/s
FDR: Fourteen Data Rate: 56 Gb/s
HDR: High Data Rate: 200 Gb/s
NDR: Next Data Rate: 400 Gb/s
OIF: Optical Internetworking Forum
PCB: Printed Circuit Board
PCIe: Peripheral Component Interconnect Express
QDR: Quad Data Rate
QSFP: Quad Small Form-factor Pluggable
QSFP+: 10 Gigabit Quad Small Form-factor Pluggable
SAS: Serial Attached SCSI
SATA: Serial Advanced Technology Attachment
SFP: Small Form-factor Pluggable
SFP+: 10 Gigabit Enhanced Small Form-factor Pluggable
VSR: Very Short Reach
XFP: 10 Gigabit small Form-factor Pluggable

3.3 Definitions

Connector: Each half of an interface that, when joined together, establish electrical contact and mechanical retention between two components. In this specification, the term connector does not apply to any specific gender; it is used to describe the receptacle, the plug or the card edge, or the union of receptacle to plug or card edge. Other common terms include: connector interface, mating interface, and separable interface.

Module: In this specification, module may refer to a plug assembly at the end of a copper (electrical) cable (passive or active), an active optical cable assembly, an optical transceiver, or a loopback.

Coherent: In coherent optical communication, data is transmitted by modulating a light wave's amplitude, phase, and/or polarization, and detected taking the phase into account.

Dual-Card Connector: Connectors in which each receptacle contact mates to one of two PCBs per port on the module side of the interface.

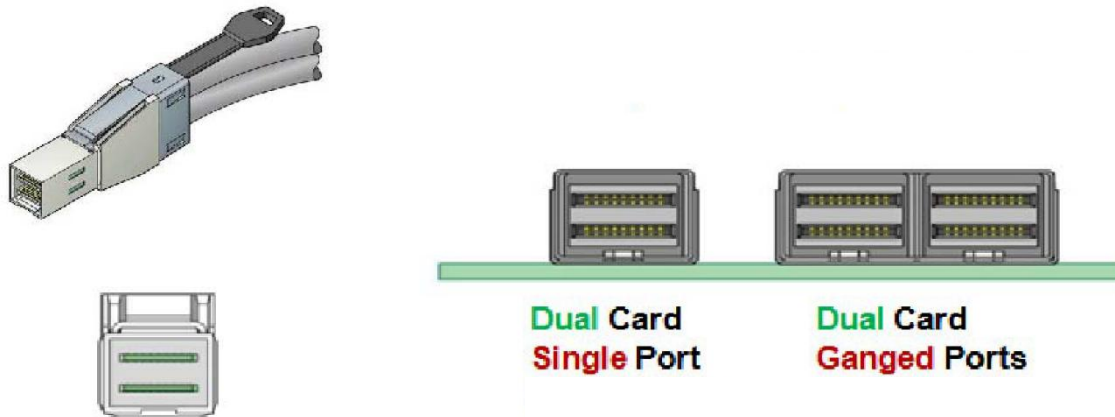


FIGURE 3-1 DUAL CARD CONNECTOR

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

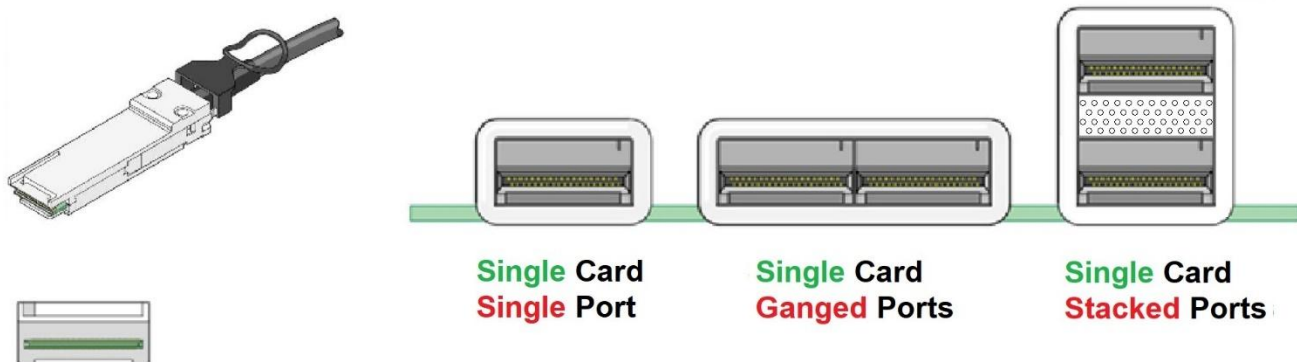


FIGURE 3-2 SINGLE CARD CONNECTOR

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

Table 4-1, Table 4-2, Table 4-3 and Table 4-4 list the relevant SFF specifications for selected pluggable modules and I/O connectors. 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 SFF-8665 for information on compatibility.**

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

	Mechanical				Low Speed & General Electrical	Management Interface			
Colloquial Name	Module	Connector	Single Port Cage	Stacked Cage					
SFP	INF-8074 → Superseded by SFP+								
SFP+	SFF-8431 → Superseded by SFP10								
SFP10	SFF-8432	SFF-8071	SFF-8432, single port, SFF-8433, ganged	—	SFF-8418 & SFF-8419	SFF-8472			
SFP16, SFP28, & SFP56					SFF-8419				
SFP112						SFF-TA-1031		—	CMIS
SFP224						TBD		—	
XFP	INF-8077								
QSFP	INF-8438 → Superseded by QSFP+								
QSFP+	SFF-8436 → Superseded by QSFP10								
QSFP10 & QSFP14	SFF-8661 SFF-TA-1027 ⁵ Section 5.3	SFF-8682	SFF-8683	—	SFF-8679	SFF-8636 ¹			
QSFP28 ²		SFF-8672 (Style B) ³							
		SFF-8662 (Style A) ³	SFF-8663 (Style A) ³						
		SFF-TA-1027	SFF-TA-1027						
QSFP56 ²		SFF-8672 (Style B) ³	SFF-8683	—		SFF-8636 or CMIS			
		SFF-8662 (Style A) ³	SFF-8663 (Style A) ³						
		SFF-TA-1027	SFF-TA-1027						
QSFP112		SFF-TA-1027 ⁵	SFF-TA-1027	SFF-TA-1027		SFF-TA-1027	CMIS ⁴		
QSFP224	SFF-TA-1027 ⁶	SFF-TA-1027 ⁷	SFF-TA-1027 ⁸	—	CMIS				

Notes:

1. Coherent modules may use CMIS
2. Not all module, connector, cage combinations are compatible. See SFF-8665 for details.
3. Both Style 'A' and Style 'B' are suitable for 28 GBd (including PAM4 use, up to 56 Gbps on each lane) applications.
4. SFF-8636 can be used for passive copper cables.
5. See section in SFF-TA-1027 titled "QSFP112 Module Mechanical Specification"
6. See section in SFF-TA-1027 titled "QSFP224 Module Mechanical Specification"
7. See section in SFF-TA-1027 titled "QSFP224 Cage Mechanical Specification"
8. See section in SFF-TA-1027 titled "QSFP224 Connector Mechanical Specification"

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 → Superseded by CXP14				InfiniBand QDR	InfiniBand Volume 2, Chapter 8
CXP14	SFF-8617				InfiniBand FDR	
CXP28					InfiniBand EDR	
HD12un	SFF-8613		NA		SAS-2.1/SAS-3	SFF-8636 & SFF-8449
HD24un					SAS-4/SAS-4.1	
HD12sh	SFF-8614				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, 2.1, 4, 4.1 SATA	2
SFF-8680	SAS-3 SATA	
SFF-8630	SAS-3, 4, 4.1 SATA	4
SFF-8639	8 and 16 GT/s PCIe SAS-3, 4, 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