SFF specifications are available at http://www.snia.org/sff/specifications
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**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

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SFF Committee

# SFF-8089 Specification for

# SFP (Small Formfactor Pluggable) Rate and Application Codes

Rev 1.3 February 3, 2005

Secretariat: SFF Committee

Abstract: This specification is a companion specification to SFF-8079 SFP Rate and Application Selection. SFF-8079 defines the hardware and software interfaces for controlling and selecting operation among multiple application capabilities within a single SFP module. One aspect of these interfaces is a structure for filling ROM fields in a SFF-8079-compatible SFP module that describes the module's specific capabilities. SFF-8089 defines specific codes for those ROM fields based on industry standards and applications, and it is a dynamic specification that will be periodically be updated to reflect changes in the industry. Other specifications than SFF-8079 may also reference this specification.

This specification provides a common specification for systems manufacturers, system integrators, and suppliers of serial communication modules. This is an internal working specification 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 specification.

Support: This specification is supported by the identified member companies of the SFF Committee.

POINTS OF CONTACT:

Jens Fiedler
Technical Editor
Infineon Technologies
Fiber Optics GmbH
Wernerwerkdamm 16
13629 Berlin
+49 30 85400 2508
+49 30 85400 4900 Fx
jens.fiedler@infineon.com

I. Dal Allan
Chairman SFF Committee
14426 Black Walnut Court
Saratoga CA 95070
408-867-6630
408-867-2115 Fx
endlcom@acm.org

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**EXPRESSION OF SUPPORT BY MANUFACTURERS**

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

ENDL
Infineon
Intel
Nexans
Sun Microsystems
Vitesse Semi

The following SFF member companies voted no on the technical content of this industry specification.

Hewlett Packard

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

Adaptec
Dell
FCI/Berg
Foxconn Int'l
Fujitsu CPA
Hitachi GST
Madison Cable
Maxtor
Molex
Seagate
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The user's attention is called to the possibility that implementation to this Specification may require use of an invention covered by patent rights. By distribution of this Specification, no position is taken with respect to the validity of this claim or of any patent rights in connection therewith. The patent holder has filed a statement of willingness to grant a license under these rights on reasonable and non-discriminatory terms and conditions to applicants desiring to obtain such a license.

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If you are not a member of the SFF Committee, but you are interested in participating, the following principles have been reprinted here for your information.

**PRINCIPLES OF THE SFF COMMITTEE**

The SFF Committee is an ad hoc group formed to address storage industry needs in a prompt manner. When formed in 1990, the original goals were limited to defining de facto mechanical envelopes within which disk drives can be developed to fit compact computer and other small products.

Adopting a common industry size simplifies the integration of small drives (2 1/2" or less) into such systems. Board-board connectors carrying power and signals, and their position relative to the envelope are critical parameters in a product that has no cables to provide packaging leeway for the integrator.

In November 1992, the SFF Committee objectives were broadened to encompass other areas which needed similar attention, such as pinouts for interface applications, and form factor issues on larger disk drives. SFF is a forum for resolving industry issues that are either not addressed by the standards process or need an immediate solution.

Specifications created by the SFF Committee are expected to be submitted to bodies such as EIA (Electronic Industries Association) or an ASC (Accredited Standards Committee). They may be accepted for separate standards, or incorporated into other standards activities.

The principles of operation for the SFF Committee are not unlike those of an accredited standards committee. There are 3 levels of participation:

- Attending the meetings is open to all, but taking part in discussions is limited to member companies, or those invited by member companies
- The minutes and copies of material which are discussed during meetings are distributed only to those who sign up to receive documentation.
- The individuals who represent member companies of the SFF Committee receive documentation and vote on issues that arise. Votes are not taken during meetings, only guidance on directions. All voting is by letter ballot, which ensures all members an equal opportunity to be heard.

Material presented at SFF Committee meetings becomes public domain. There are no restrictions on the open mailing of material presented at committee meetings. In order to reduce disagreements and misunderstandings, copies must be provided for all agenda items that are discussed. Copies of the material presented, or revisions if completed in time, are included in the documentation mailings.

The sites for SFF Committee meetings rotate based on which member companies volunteer to host the meetings. Meetings have typically been held during the ASC T10 weeks.

The funds received from the annual membership fees are placed in escrow, and are used to reimburse ENDL for the services to manage the SFF Committee.

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If you are not receiving the documentation of SFF Committee activities or are interested in becoming a member, the following signup information is reprinted here for your information.

Membership includes voting privileges on SFF Specs under development.

CD_Access Electronic documentation contains:
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- The current revision of all the SFF Specifications, as well as any previous revisions distributed during the current year.

Meeting documentation contains:
- Minutes for the current meeting cycle.
- Copies of Specifications revised during the current meeting cycle.

Each electronic mailing obsoletes the previous mailing of that year e.g. July replaces May. To build a complete set of archives of all SFF documentation, retain the last SFF CD_Access mailing of each year.

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___ Voting Membership w/Meeting documentation $ 1,800

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SFF Committee
14426 Black Walnut Ct
Saratoga CA 95070

408-867-6630
408-867-2115Fx
endlcom@acm.org

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**Foreword**

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 in which space was at a premium and time to market with the latest machine was an important factor. System integrators worked individually with vendors to develop the packaging. The result was wide diversity, and with space being such a major consideration in packaging, it was not possible to replace one vendor's drive with a competitive product.

The desire to reduce disk drive sizes to even smaller dimensions such as 1.8" and 1.3" made it likely that devices would become even more constrained in dimensions because of a possibility that such small devices could be inserted into a socket, not unlike the method of retaining semiconductor devices.

The problems faced by integrators, device suppliers, and component suppliers led to the formation of an industry ad hoc group to address the marketing and engineering considerations of the emerging new technology in disk drives. After two informal gatherings on the subject in the summer of 1990, the SFF Committee held its first meeting in August.

During the development of the form factor definitions, other activities were suggested because participants in the SFF Committee faced problems other than the physical form factors of disk drives. In November 1992, the members approved an expansion in charter 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.

At the same time, the principle was adopted of restricting the scope of an SFF project to a narrow area, so that the majority of specifications would be small and the projects could be completed in a rapid timeframe. If proposals are made by a number of contributors, the participating members select the best concepts and uses them to develop specifications which address specific issues in emerging storage markets.

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.

Suggestions for improvement of this specification will be welcome. They should be sent to the SFF Committee, 14426 Black Walnut Ct, Saratoga,  CA 95070.

The development work on this specification was done by the SFF Committee, an industry group. The membership of the committee since its formation in 1990 has included a mix of companies which are leaders across the industry.

## Table of Contents



## List of Tables

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SFF Committee –

# SFP (Small Formfactor Pluggable) Rate and Application Codes

## 1.0 Scope

This specification does not stand on its own, but is a companion specification to SFF-8079 SFP Rate and Application Selection. SFF-8089 sets the codes for the firmware tables defined within SFF-8079. Other documents than SFF-8079 may also reference this specification.

## 2.0 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 may be relevant to this specification.

| | |
|---|---|
| - INCITS 230-1994 | FC-PH Fibre Channel Physical Interface |
| - INCITS 297-1997 | FC-PH-2 Fibre Channel Physical Interface |
| - INCITS 352-2002 | FC-PI Fibre Channel Physical Interface |
| - INCITS 339-2000 | Very Long Length Single Mode Optical Variant (SM-LL-V) |
| - INCITS 364-200x | Fibre Channel -10 Gigabit (10GFC) |
| - INCITS Project 1506-D | Fibre Channel Physical Interfaces - 2 (FC-PI-2) |
| - INCITS Project 1625-D | Fibre Channel Physical Interfaces - 3 (FC-PI-3) |
| - IEEE-802.3 Edition 2002 | Ethernet Specification |
| - Telcordia GR-253-CORE | Synchronous Optical Network (SONET) Transport Systems |
| - ITU-T G.691 | Transmission Systems/Media, Digital Systems/Networks |

### 2.2 Key SFF Documents

| | |
|---|---|
| - INF-8074 | SFP (Small Formfactor Pluggable) Transceiver |
| - SFF-8472 | Digital Diagnostic Monitoring Interface for Optical Transceivers |
| - SFF-8079 | SFP Rate and Application Selection |

### 2.3 SFF Specifications

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

| | |
|---|---|
| F = Forwarded | The specification has been approved by the members for forwarding to a formal standards body. |
| P = Published | The specification has been balloted by members and is available as a published SFF Specification. |
| A = Approved | The specification 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 specification is under development at SFF. |
| E = Expired | The specification has been published, and the members voted against re-publishing when it came up for review. |
| a = archive | Used as a suffix to indicate an SFF Specification which has been Archived. This specification will always be available at the ftp site and new development effort in the subject area shall be done under a new number. |
| 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 |

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available in hard copy.

i = Information The specification has no SFF project activity in progress, but it defines features in developing industry standards. The specification 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). As the copyright on such documents is retained by the author, the INF or 'i' specifications cannot be freely copied for distribution.

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

| Spec # | Rev | List of Specifications as of February 3, 2005 |
|---|---|---|
| SFF-8000 | | SFF Committee Information |
| INF-8001i | E | 44-pin ATA (AT Attachment) Pinouts for SFF Drives |
| INF-8002i | E | 68-pin ATA (AT Attachment) for SFF Drives |
| SFF-8003 | E | SCSI Pinouts for SFF Drives |
| SFF-8004 | E | Small Form Factor 2.5" Drives |
| SFF-8005 | E | Small Form Factor 1.8" Drives |
| SFF-8006 | E | Small Form Factor 1.3" Drives |
| SFF-8007 | E | 2mm Connector Alternatives |
| SFF-8008 | E | 68-pin Embedded Interface for SFF Drives |
| SFF-8009 | 4.1 | Unitized Connector for Cabled Drives |
| SFF-8010 | E | Small Form Factor 15mm 1.8" Drives |
| INF-8011i | E | ATA Timing Extensions for Local Bus |
| SFF-8012 | 3.0 | 4-Pin Power Connector Dimensions |
| SFF-8013 | E | ATA Download Microcode Command |
| SFF-8014 | C | Unitized Connector for Rack Mounted Drives |
| SFF-8015 | E | SCA Connector for Rack Mounted SFF SCSI Drives |
| SFF-8016 | C | Small Form Factor 10mm 2.5" Drives |
| SFF-8017 | E | SCSI Wiring Rules for Mixed Cable Plants |
| SFF-8018 | E | ATA Low Power Modes |
| SFF-8019 | E | Identify Drive Data for ATA Disks up to 8 GB |
| INF-8020i | E | ATA Packet Interface for CD-ROMs |
| SFF-8025 | 0.7 | SFF Committee Specification Categories |
| INF-8028i | E | - Errata to SFF-8020 Rev 2.5 |
| SFF-8029 | E | - Errata to SFF-8020 Rev 1.2 |
| SFF-8030 | 2.0 | SFF Committee Charter |
| SFF-8031 | | Named Representatives of SFF Committee Members |
| SFF-8032 | 1.6 | SFF Committee Principles of Operation |
| INF-8033i | E | Improved ATA Timing Extensions to 16.6 MBs |
| INF-8034i | E | High Speed Local Bus ATA Line Termination Issues |
| INF-8035i | E | Self-Monitoring, Analysis & Reporting Technology |
| INF-8036i | E | ATA Signal Integrity Issues |
| INF-8037i | E | Intel Small PCI SIG |
| INF-8038i | E | Intel Bus Master IDE ATA Specification |
| INF-8039i | E | Phoenix EDD (Enhanced Disk Drive) Specification |
| SFF-8040 | 1.2 | 25-pin Asynchronous SCSI Pinout |
| SFF-8041 | C | SCA-2 Connector Backend Configurations |
| SFF-8042 | C | VHDCI Connector Backend Configurations |
| SFF-8043 | E | 40-pin MicroSCSI Pinout |
| SFF-8045 | 4.7 | 40-pin SCA-2 Connector w/Parallel Selection |
| SFF-8046 | E | 80-pin SCA-2 Connector for SCSI Disk Drives |
| SFF-8047 | C | 40-pin SCA-2 Connector w/Serial Selection |
| SFF-8048 | C | 80-pin SCA-2 Connector w/Parallel ESI |
| SFF-8049 | E | 80-conductor ATA Cable Assembly |
| INF-8050i | 1.0 | Bootable CD-ROM |
| INF-8051i | E | Small Form Factor 3" Drives |

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| | | |
|---|---|---|
| INF-8052i | E | ATA Interface for 3" Removable Devices |
| SFF-8053 | 5.5 | GBIC (Gigabit Interface Converter) |
| SFF-8054 | 0.2 | Automation Drive Interface Connector |
| INF-8055i | E | SMART Application Guide for ATA Interface |
| SFF-8056 | C | 50-pin 2mm Connector |
| SFF-8057 | E | Unitized ATA 2-plus Connector |
| SFF-8058 | E | Unitized ATA 3-in-1 Connector |
| SFF-8059 | E | 40-pin ATA Connector |
| SFF-8060 | 1.1 | SFF Committee Patent Policy |
| SFF-8061 | E | Emailing drawings over the SFF Reflector |
| SFF-8062 | | Rolling Calendar of SSWGs and Plenaries |
| SFF-8064 | | Unshielded HD Cable/Board Connector System |
| SFF-8065 | C | 40-pin SCA-2 Connector w/High Voltage |
| SFF-8066 | C | 80-pin SCA-2 Connector w/High Voltage |
| SFF-8067 | 3.3 | 40-pin SCA-2 Connector w/Bidirectional ESI |
| INF-8068i | E | Guidelines to Import Drawings into SFF Specs |
| SFF-8069 | E | Fax-Access Instructions |
| INF-8070i | 1.3 | ATAPI for Rewritable Removable Media |
| SFF-8072 | 1.2 | 80-pin SCA-2 for Fibre Channel Tape Applications |
| SFF-8073 | C | 20-pin SCA-2 for GBIC Applications |
| INF-8074i | 1.0 | SFP (Small Formfactor Pluggable) Transceiver |
| SFF-8075 | 1.0 | PCI Card Version of SFP Cage |
| SFF-8076 | - | SFP Additional IDs |
| INF-8077i | 3.1 | XFP (10 Gbs Small Form Factor Pluggable Module) |
| SFF-8078 | C | XFP-E |
| SFF-8079 | 1.7 | SFP Rate and Application Selection |
| SFF-8080 | E | ATAPI for CD-Recordable Media |
| SFF-8082 | 4.0 | Labeling of Ports and Cable Assemblies |
| SFF-8084 | 0.2 | 0.8mm SFP Card Edge Connector Dimensioning |
| SFF-8085 | 0.9 | 100 Mbs Small Formfactor Transceivers |
| SFF-8086 | | 0.8mm Card Edge Connector Mating Interface |
| SFF-8087 | | 0.8mm Unshielded Connector |
| SFF-8088 | | 0.8mm Shielded Connector |
| SFF-8089 | 1.3 | SFP Rate and Application Selection Values |
| INF-8090i | 1.6 | ATAPI for Multimedia Devices (Mt Fuji5) |
| SFF-8101 | C | 3 Gbs and 4 Gbs Signal Characteristics |
| SFF-8110 | C | 5V Parallel 1.8" drive form factor |
| SFF-8111 | 1.3 | 1.8" drive form factor (60x70mm) |
| SFF-8122 | | 1.8" (60x70mm) w/SCA-2 Connector |
| SFF-8120 | 2.6 | 1.8" drive form factor (78x54mm) |
| SFF-8123 | C | 1.8" (60x70mm) w/Serial Attachment Connector |
| SFF-8124 | 0.2 | Memory Form Factor Disk Drive Connections |
| SFF-8200e | 1.1 | 2 1/2" drive form factors (all of 82xx family) |
| SFF-8201 | 2.3 | 2 1/2" drive form factor dimensions |
| SFF-8212e | 1.2 | 2 1/2" drive w/SFF-8001 44-pin ATA Connector |
| SFF-8221 | 3.5 | Pre-Aligned 2.5" Drive >10mm Form Factor |
| SFF-8222 | 2.1 | 2.5" Drive w/SCA-2 Connector |
| SFF-8223 | 2.4 | 2.5" Drive w/Serial Attachment Connector |
| SFF-8225 | C | 2.5" Single Voltage Drive |
| SFF-8300 | 1.2 | 3 1/2" drive form factors (all of 83xx family) |
| SFF-8301 | 1.4 | 3 1/2" drive form factor dimensions |
| SFF-8302e | 1.1 | 3 1/2" Cabled Connector locations |
| SFF-8323 | 1.4 | 3 1/2" drive w/Serial Attachment Connector |
| SFF-8332e | E | 3 1/2" drive w/80-pin SFF-8015 SCA Connector |
| SFF-8337e | E | 3 1/2" drive w/SCA-2 Connector |
| SFF-8342e | 1.3 | 3 1/2" drive w/Serial Unitized Connector |
| INF-8350i | E | 3 1/2" Packaged Drives |
| SFF-8400 | C | VHDCI (Very High Density Cable Interconnect) |

Published

| | | |
|---|---|---|
| SFF-8410 | 16.1 | High Speed Serial Testing for Copper Links |
| INF-8411 | 1.0 | High Speed Serial Testing for Backplanes |
| SFF-8412 | 12.2 | HSOI (High Speed Optical Interconnect) Testing |
| SFF-8415 | 4.1 | HPEI (High Performance Electrical Interconnect) |
| SFF-8416 | 10.0 | HPEI Bulk Cable Measurement/Performance Reqmnts |
| | | |
| SFF-8420 | 11.1 | HSSDC-1 Shielded Connections |
| SFF-8421 | 2.4 | HSSDC-2 Shielded Connections |
| SFF-8422 | C | FCI Shielded Connections |
| SFF-8423 | C | Molex Shielded Connections |
| SFF-8424 | 0.5 | Dual Row HSSDC-2 Shielded Connections |
| SFF-8425 | 1.4 | Single Voltage 12V Drives |
| SFF-8426 | | HSSDC Double Width |
| SFF-8429 | 0.0 | Signal Specification Architecture for HSS Links |
| | | |
| SFF-8430 | 4.1 | MT-RJ Duplex Optical Connections |
| SFF-8431 | | SFP+ |
| SFF-8441 | 14.1 | VHDCI Shielded Configurations |
| SFF-8451 | 10.1 | SCA-2 Unshielded Connections |
| SFF-8452 | 3.1 | Glitch Free Mating Connections for Multidrop Aps |
| SFF-8453 | | Shielded High Speed Serial connectors |
| | | |
| SFF-8460 | 1.2 | HSS Backplane Design Guidelines |
| SFF-8464 | | Improved MM HSS Optical Link Performance |
| SFF-8470 | 2.9 | Multi Lane Copper Connector |
| SFF-8471 | C | ZFP Multi Lane Copper Connector |
| SFF-8472 | 9.5 | Diagnostic Monitoring Interface for Optical Xcvrs |
| INF-8475i | 2.2 | XPAK Small Formfactor Pluggable Receiver |
| SFF-8480 | 2.1 | HSS (High Speed Serial) DB9 Connections |
| SFF-8482 | 1.5 | Unshielded Dual Port Serial Attachment Connector |
| SFF-8483 | C | External Serial Attachment Connector |
| SFF-8484 | 0.6 | MultiLane Unshielded Serial Attachment Connector |
| SFF-8485 | 0.4 | Serial GPIO (General Purpose Input/Output) Bus |
| | | |
| SFF-8500e | 1.1 | 5 1/4" drive form factors (all of 85xx family) |
| SFF-8501e | 1.1 | 5 1/4" drive form factor dimensions |
| SFF-8508e | 1.1 | 5 1/4" ATAPI CD-ROM w/audio connectors |
| SFF-8523 | 1.3 | 5 1/4" drive w/Serial Attachment Connector |
| SFF-8551 | 3.2 | 5 1/4" CD Drives form factor |
| SFF-8552 | 1.1 | 5 1/4" 9.5mm/12.7mm Optical Drive Form Factor |
| SFF-8572 | C | 5 1/4" Tape form factor |
| SFF-8610 | C | SDX (Storage Device Architecture) |

### 2.4 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 or by download at ftp://ftp.seagate.com/sff

| | |
|---|---|
| 14426 Black Walnut Ct | 408-867-6630x303 |
| Saratoga | 408-867-2115Fx |
| CA 95070 | |

## 3.0 General Description

Based on the trend in the market to consolidate SFP transceivers in order to achieve multi-rate and multi-application capable products, an upgraded feature set for the existing Rate select, as described in INF-8074 and SFF-8472, has been developed and specified in SFF-8079.

In order to support a wide variety of applications, two-pin hardware and two-byte serial software interfaces have been defined in SFF-8079. SFF-8079 also defines how the specific applications that a single SFP transceiver supports are listed in the module's ROM, and how the list is read and how a specific application is selected by the host.

SFF-8079 defines the ROM memory space to be within A0h byte 128 to 255. Two bytes for each supported application represent a category and a sub-category. This helps organization and provides sufficient room for up to 63 variants to allow a wide range of potential solutions. Further details can be found in SFF-8079.

SFF-8089 attempts to provide a complete "shopping list" of possible applications based on industry standards. Module vendors can select a sub-list of applications they want to support and program the associated codes into the A0h memory space. In addition to industry standard applications, space is set aside for proprietary or custom applications (details would be provided within the module vendor's data sheets).

This specification is expected to be updated frequently to track and reflect the dynamic market and new or upcoming solutions.

## 4.0 SFP Rate and Application Codes

### 4.1 Introduction

Within this clause, the application codes are listed for use according to SFF-8079.

Table 4-1 is the complete "shopping list" of information needed to create the vendor-specific list of supported applications in module memory. The table shows the associated hex codes (Byte 1 and Byte 2) assigned for each application (see SFF-8079 for an explanation for usage of Byte 1 and Byte 2). The Description columns are informative and further describe the listed applications.

The table incorporates room for each category and sub-category in order to allow implementation of future options.

### 4.2 Application Code Table (ACT)

**Table 4-1 Application Code Table**

| Byte 1# (hex) | Byte 2# (hex) | Category | Variant | | Description | |
|---|---|---|---|---|---|---|
| | | Standard | Bit Rate [Mb/s] | Variant | According to | Comment |
| 0 | 00-FF | custom | | custom | Reserved for vendor specific use | |
| 1 | 00 | Fibre Channel | 1.062,50 | 100-Mx-SN-I | FC-PI-2 | |
| 1 | 01 | Fibre Channel | 1.062,50 | 100-SM-LC-L | FC-PI-2 | |
| 1 | 02 | Fibre Channel | 1.062,50 | 100-SM-LL-V | FC-PI-2 | |
| 1 | 03 | Fibre Channel | 1.062,50 | 100-SE-EL-S | FC-PI-2 | |
| 1 | 04 | Fibre Channel | 1.062,50 | 100-DF-EL-S | FC-PI-2 | |
| 1 | 05-09 | Fibre Channel | 1.062,50 | *RFU* | | Reserved for future Use |
| 1 | 0A | Fibre Channel | 2.125,00 | 200-Mx-SN-I | FC-PI-2 | |
| 1 | 0B | Fibre Channel | 2.125,00 | 200-SM-LC-L | FC-PI-2 | |
| 1 | 0C | Fibre Channel | 2.125,00 | 200-SM-LL-V | FC-PI-2 | |
| 1 | 0D | Fibre Channel | 2.125,00 | 200-SE-EL-S | FC-PI-2 | |
| 1 | 0E | Fibre Channel | 2.125,00 | 200-DF-EL-S | FC-PI-2 | |
| 1 | 0F-13 | Fibre Channel | 2.125,00 | *RFU* | | Reserved for future Use |
| 1 | 14 | Fibre Channel | 4.250,00 | 400-Mx-SN-S | FC-PI-2 | |
| 1 | 15 | Fibre Channel | 4.250,00 | 400-SM-LC-L | FC-PI-2 | |
| 1 | 16 | Fibre Channel | 4.250,00 | 400-DF-EL-S | FC-PI-2 | |
| 1 | 17 | Fibre Channel | 4.250,00 | 400-SE-EL-S | FC-PI-2 | |
| 1 | 18 | Fibre Channel | 4.250,00 | MMF 62.5 | FC-PI-4 | |
| 1 | 19 | Fibre Channel | 4.250,00 | MMF 50 | FC-PI-4 | |
| 1 | 1A-31 | Fibre Channel | 4.250,00 | *RFU* | | Reserved for future Use |
| 1 | 32 | Fibre Channel | 8.500,00 | 800-Mx-SN-I | | |
| 1 | 33 | Fibre Channel | 8.500,00 | 800-SM-LL-L | | |
| 1 | 34-59 | Fibre Channel | 8.500,00 | *RFU* | | Reserved for future Use |
| 1 | 5A | Fibre Channel | 10.518,75 | 1200-Mx-SN-I | 10GFC | |
| 1 | 5B | Fibre Channel | 10.518,75 | 1200-SM-LL-L | 10GFC | |
| 1 | 5C | Fibre Channel | 10.519,75 | 1200-SM-LC-L | FC-PI-3 | |
| 1 | 5D-FF | Fibre Channel | *RFU* | | | Reserved for future Use |
| 2 | 00 | Ethernet | 125,00 | 100BASE-FX | 802.3-2002 | |
| 2 | 01 | Ethernet | 125,00 | 100BASE-LX/LX10 | 802.3ah | |
| 2 | 02 | Ethernet | 125,00 | 100BASE-BX10 | 802.3ah | |
| 2 | 03-04 | Ethernet | 125,00 | *RFU* | | Reserved for future Use |
| 2 | 05 | Ethernet | 1.250,00 | 1000BASE-SX | IEEE P802.3z | |
| 2 | 06 | Ethernet | 1.250,00 | 1000BASE-LX | IEEE P802.3z | |
| 2 | 07 | Ethernet | 1.250,00 | 1000BASE-BX10 | 802.3ah | |
| 2 | 08 | Ethernet | 1.250,00 | 1000BASE-LX10 | 802.3ah | |
| 2 | 09 | Ethernet | 1.250,00 | 1000BASE-PX10 | 802.3ah | |
| 2 | 0A | Ethernet | 1.250,00 | 1000BASE-LX20 | 802.3ah | |
| 2 | 0B | Ethernet | 1.250,00 | 1000BASE-CX | IEEE P802.3z | |
| 2 | 0C | Ethernet | 1.250,00 | 1000BASE T | IEEE P802.3z | |
| 2 | 0D-13 | Ethernet | 1.250,00 | *RFU* | | Reserved for future Use |
| 2 | 14 | Ethernet | 9.953,28 | 10GBASE-SW | IEEE P802.3ae | |
| 2 | 15 | Ethernet | 9.953,28 | 10GBASE-LW | IEEE P802.3ae | |
| 2 | 16 | Ethernet | 10.312,50 | 10GBASE-LR | IEEE P802.3ae | |
| 2 | 17 | Ethernet | 9.953,28 | 10GBASE-EW | IEEE P802.3ae | |
| 2 | 18 | Ethernet | 10.312,50 | 10GBASE-ER | IEEE P802.3ae | |
| 2 | 19 | Ethernet | 10.312,50 | 10GBASE-T | IEEE 802.3 xx | |
| 2 | 1A-FF | Ethernet | *RFU* | | | Reserved for future Use |

| Byte 1# (hex) | Byte 2# (hex) | Category | Variant | | Description | |
|---|---|---|---|---|---|---|
| | | Standard | Bit Rate [Mb/s] | Variant | According to | Comment |
| 3 | 00 | SONET/SDH | 155,52 | I-1 | ITU-T G.957 | |
| 3 | 01 | SONET/SDH | 155,52 | S-1.1 | ITU-T G.957 | |
| 3 | 02 | SONET/SDH | 155,52 | S-1.2 | ITU-T G.957 | |
| 3 | 03 | SONET/SDH | 155,52 | L-1.1 | ITU-T G.957 | |
| 3 | 04 | SONET/SDH | 155,52 | L-1.2 | ITU-T G.957 | |
| 3 | 05 | SONET/SDH | 155,52 | L-1.3 | ITU-T G.957 | |
| 3 | 06 | SONET/SDH | 155,52 | SR-1 | Telcordia GR-253-CORE | |
| 3 | 07 | SONET/SDH | 155,52 | IR-1 | Telcordia GR-253-CORE | |
| 3 | 08 | SONET/SDH | 155,52 | IR-2 | Telcordia GR-253-CORE | |
| 3 | 09 | SONET/SDH | 155,52 | LR-1 | Telcordia GR-253-CORE | |
| 3 | 0A | SONET/SDH | 155,52 | LR-2 | Telcordia GR-253-CORE | |
| 3 | 0B | SONET/SDH | 155,52 | LR-3 | Telcordia GR-253-CORE | |
| 3 | 0C-1D | SONET/SDH | 155,52 | *RFU* | | Reserved for future Use |
| 3 | 1E | SONET/SDH | 622,08 | I-4 | ITU-T G.957 | |
| 3 | 1F | SONET/SDH | 622,08 | S-4.1 | ITU-T G.957 | |
| 3 | 20 | SONET/SDH | 622,08 | S-4.2 | ITU-T G.957 | |
| 3 | 21 | SONET/SDH | 622,08 | L-4.1 | ITU-T G.957 | |
| 3 | 22 | SONET/SDH | 622,08 | L-4.2 | ITU-T G.957 | |
| 3 | 23 | SONET/SDH | 622,08 | L-4.3 | ITU-T G.957 | |
| 3 | 24 | SONET/SDH | 622,08 | V-4.1 | ITU-T G.691 | |
| 3 | 25 | SONET/SDH | 622,08 | V-4.2 | ITU-T G.691 | |
| 3 | 26 | SONET/SDH | 622,08 | V-4.3 | ITU-T G.691 | |
| 3 | 27 | SONET/SDH | 622,08 | U-4.2 | ITU-T G.691 | |
| 3 | 28 | SONET/SDH | 622,08 | U-4.3 | ITU-T G.691 | |
| 3 | 29 | SONET/SDH | 622,08 | SR-1 | Telcordia GR-253-CORE | |
| 3 | 2A | SONET/SDH | 622,08 | IR-1 | Telcordia GR-253-CORE | |
| 3 | 2B | SONET/SDH | 622,08 | IR-2 | Telcordia GR-253-CORE | |
| 3 | 2C | SONET/SDH | 622,08 | LR-1 | Telcordia GR-253-CORE | |
| 3 | 2D | SONET/SDH | 622,08 | LR-2 | Telcordia GR-253-CORE | |
| 3 | 2E | SONET/SDH | 622,08 | LR-3 | Telcordia GR-253-CORE | |
| 3 | 2F-3B | SONET/SDH | 622,08 | *RFU* | | Reserved for future Use |
| 3 | 3C | SONET/SDH | 2.488,32 | I-16 | ITU-T G.957 | |
| 3 | 3D | SONET/SDH | 2.488,32 | S-16.1 | ITU-T G.957 | |
| 3 | 3E | SONET/SDH | 2.488,32 | S-16.2 | ITU-T G.957 | |
| 3 | 3F | SONET/SDH | 2.488,32 | L-16.1 | ITU-T G.957 | |
| 3 | 40 | SONET/SDH | 2.488,32 | L-16.2 | ITU-T G.957 | |
| 3 | 41 | SONET/SDH | 2.488,32 | L-16.3 | ITU-T G.957 | |
| 3 | 42 | SONET/SDH | 2.488,32 | V-16.2 | ITU-T G.691 | |
| 3 | 43 | SONET/SDH | 2.488,32 | V-16.3 | ITU-T G.691 | |
| 3 | 44 | SONET/SDH | 2.488,32 | U-16.2 | ITU-T G.691 | |
| 3 | 45 | SONET/SDH | 2.488,32 | U-16.3 | ITU-T G.691 | |
| 3 | 46 | SONET/SDH | 2.488,32 | SR-1 | Telcordia GR-253-CORE | |
| 3 | 47 | SONET/SDH | 2.488,32 | IR-1 | Telcordia GR-253-CORE | |
| 3 | 48 | SONET/SDH | 2.488,32 | IR-2 | Telcordia GR-253-CORE | |
| 3 | 49 | SONET/SDH | 2.488,32 | LR-1 | Telcordia GR-253-CORE | |
| 3 | 4A | SONET/SDH | 2.488,32 | LR-2 | Telcordia GR-253-CORE | |
| 3 | 4B | SONET/SDH | 2.488,32 | LR-3 | Telcordia GR-253-CORE | |
| 3 | 4C-59 | SONET/SDH | 2.488,32 | *RFU* | | Reserved for future Use |
| 3 | 5A | SONET/SDH | 9.953,28 | VSR600-2M1 | ITU-T G.vsr | |
| 3 | 5B | SONET/SDH | 9.953,28 | VSR600-2M2 | ITU-T G.vsr | |
| 3 | 5C | SONET/SDH | 9.953,28 | VSR600-2M5 | ITU-T G.vsr | |

| Byte 1# (hex) | Byte 2# (hex) | Category | Variant | | Description | |
|---|---|---|---|---|---|---|
| | | Standard | Bit Rate [Mb/s] | Variant | According to | Comment |
| 3 | 5D | SONET/SDH | 9.953,28 | I-64.1r | ITU-T G.691 | |
| 3 | 5E | SONET/SDH | 9.953,28 | I-64.1 | ITU-T G.691 | |
| 3 | 5F | SONET/SDH | 9.953,28 | I-64.2r | ITU-T G.691 | |
| 3 | 60 | SONET/SDH | 9.953,28 | I-64.2 | ITU-T G.691 | |
| 3 | 61 | SONET/SDH | 9.953,28 | I-64.3 | ITU-T G.691 | |
| 3 | 62 | SONET/SDH | 9.953,28 | I-64.5 | ITU-T G.691 | |
| 3 | 63 | SONET/SDH | 9.953,28 | S-64.1 | ITU-T G.691 | |
| 3 | 64 | SONET/SDH | 9.953,28 | S-64.2a | ITU-T G.691 | |
| 3 | 65 | SONET/SDH | 9.953,28 | S-64.2b | ITU-T G.691 | |
| 3 | 66 | SONET/SDH | 9.953,28 | S-64.3a | ITU-T G.691 | |
| 3 | 67 | SONET/SDH | 9.953,28 | S-64.3b | ITU-T G.691 | |
| 3 | 68 | SONET/SDH | 9.953,28 | S-64.5a | ITU-T G.691 | |
| 3 | 69 | SONET/SDH | 9.953,28 | S-64.5b | ITU-T G.691 | |
| 3 | 6A | SONET/SDH | 9.953,28 | L-64.1 | ITU-T G.691 | |
| 3 | 6B | SONET/SDH | 9.953,28 | L-64.2a | ITU-T G.691 | |
| 3 | 6C | SONET/SDH | 9.953,28 | L-64.2b | ITU-T G.691 | |
| 3 | 6D | SONET/SDH | 9.953,28 | L-64.2c | ITU-T G.691 | |
| 3 | 6E | SONET/SDH | 9.953,28 | L-64.3 | ITU-T G.691 | |
| 3 | 6F | SONET/SDH | 9.953,28 | V-64.2a | ITU-T G.691 | |
| 3 | 70 | SONET/SDH | 9.953,28 | V-64.2b | ITU-T G.691 | |
| 3 | 71 | SONET/SDH | 9.953,28 | V-64.3 | ITU-T G.691 | |
| 3 | 72 | SONET/SDH | 9.953,28 | SR-1 | Telcordia GR-253-CORE | |
| 3 | 73 | SONET/SDH | 9.953,28 | SR-2 | Telcordia GR-253-CORE | |
| 3 | 74 | SONET/SDH | 9.953,28 | IR-1 | Telcordia GR-253-CORE | |
| 3 | 75 | SONET/SDH | 9.953,28 | IR-2 | Telcordia GR-253-CORE | |
| 3 | 76 | SONET/SDH | 9.953,28 | IR-3 | Telcordia GR-253-CORE | |
| 3 | 77 | SONET/SDH | 9.953,28 | LR-1 | Telcordia GR-253-CORE | |
| 3 | 78 | SONET/SDH | 9.953,28 | LR-2a | Telcordia GR-253-CORE | |
| 3 | 79 | SONET/SDH | 9.953,28 | LR-2b | Telcordia GR-253-CORE | |
| 3 | 7A | SONET/SDH | 9.953,28 | LR-2c | Telcordia GR-253-CORE | |
| 3 | 7B | SONET/SDH | 9.953,28 | LR-3 | Telcordia GR-253-CORE | |
| 3 | 7C | SONET/SDH | 9.953,28 | VR-1 | Telcordia GR-253-CORE | |
| 3 | 7D | SONET/SDH | 9.953,28 | VR-2a | Telcordia GR-253-CORE | |
| 3 | 7E | SONET/SDH | 9.953,28 | VR-3 | Telcordia GR-253-CORE | |
| 3 | 7F-FF | SONET/SDH | *RFU* | | | Reserved for future Use |
| 4 | 00 | Infiniband | 2.500,00 | IB-1x-SX | IBA_Vol2_Rel1.1_ physical_spec | |
| 4 | 01 | Infiniband | 2.500,00 | IB-1x-LX | IBA_Vol2_Rel1.1_ physical_spec | |
| 4 | 02 | Infiniband | 2.500,00 | 1x copper active | IBA_Vol2_Rel1.1_ physical_spec | |
| 4 | 03 | Infiniband | 2.500,00 | 1x copper passive | IBA_Vol2_Rel1.1_ physical_spec | |
| 4 | 04-FF | Infiniband | *RFU* | | | Reserved for future Use |
| 5 | 00 | SBCON | 200,00 | ESCON, MMF 1310nm LED | SBCON_X3.296_199x_ Rev.2.3 | |
| 5 | 01 | SBCON | 200,00 | ESCON, SMF 1310nm Laser | SBCON_X3.296_199x_ Rev.2.3 | |
| 5 | 02-FF | SBCON | *RFU* | | | Reserved for future Use |
| 6 | 00 | Copper channel loss | 1.062,50 | 100-Delta-Cu-0.5dB | Loss Measured at ½ the Baudrate | 0.5 dB Loss for copper channel |
| 6 | 01 | Copper channel loss | 1.062,50 | 100-Delta-Cu-1dB | Loss Measured at ½ the Baudrate | 1dB Loss for copper channel |

| Byte 1# (hex) | Byte 2# (hex) | Category | Variant | | Description | |
|---|---|---|---|---|---|---|
| | | Standard | Bit Rate [Mb/s] | Variant | According to | Comment |
| 6 | 02 | Copper channel loss | 1.062,50 | 100-Delta-Cu-1.5dB | Loss Measured at ½ the Baudrate | 1.5dB Loss for copper channel |
| 6 | 03 | Copper channel loss | 1.062,50 | 100-Delta-Cu-2dB | Loss Measured at ½ the Baudrate | 2dB Loss for copper channel |
| 6 | 04 | Copper channel loss | 1.062,50 | 100-Delta-Cu-2.5dB | Loss Measured at ½ the Baudrate | 2.5dB Loss for copper channel |
| 6 | 05 | Copper channel loss | 1.062,50 | 100-Delta-Cu-3dB | Loss Measured at ½ the Baudrate | 3dB Loss for copper channel |
| 6 | 06 | Copper channel loss | 1.062,50 | 100-Delta-Cu-3.5dB | Loss Measured at ½ the Baudrate | 3.5dB Loss for copper channel |
| 6 | 07 | Copper channel loss | 1.062,50 | 100-Delta-Cu-4dB | Loss Measured at ½ the Baudrate | 4dB Loss for copper channel |
| 6 | 08 | Copper channel loss | 1.062,50 | 100-Delta-Cu-4.5dB | Loss Measured at ½ the Baudrate | 4.5dB Loss for copper channel |
| 6 | 09 | Copper channel loss | 1.062,50 | 100-Delta-Cu-5dB | Loss Measured at ½ the Baudrate | 5dB Loss for copper channel |
| 6 | 0A | Copper channel loss | 1.062,50 | 100-Delta-Cu-5.5dB | Loss Measured at ½ the Baudrate | 5.5dB Loss for copper channel |
| 6 | 0B | Copper channel loss | 1.062,50 | 100-Delta-Cu-6dB | Loss Measured at ½ the Baudrate | 6dB Loss for copper channel |
| 6 | 0C | Copper channel loss | 1.062,50 | 100-Delta-Cu-6.5dB | Loss Measured at ½ the Baudrate | 6.5dB Loss for copper channel |
| 6 | 0D | Copper channel loss | 1.062,50 | 100-Delta-Cu-7dB | Loss Measured at ½ the Baudrate | 7dB Loss for copper channel |
| 6 | 0E | Copper channel loss | 1.062,50 | 100-Delta-Cu-7.5dB | Loss Measured at ½ the Baudrate | 7.5dB Loss for copper channel |
| 6 | 0F-13 | Copper channel loss | 1.062,50 | *RFU* | | Reserved for future Use |
| 6 | 14 | Copper channel loss | 2.125,00 | 200-Delta-Cu | Loss Measured at ½ the Baudrate | |
| 6 | 15 | Copper channel loss | 2.125,00 | 200-Delta-Cu-0.75dB | Loss Measured at ½ the Baudrate | 0.75dB Loss for copper channel |
| 6 | 16 | Copper channel loss | 2.125,00 | 200-Delta-Cu-1.5dB | Loss Measured at ½ the Baudrate | 1.5dB Loss for copper channl |
| 6 | 17 | Copper channel loss | 2.125,00 | 200-Delta-Cu-2.25dB | Loss Measured at ½ the Baudrate | 2.25dB Loss for copper channel |
| 6 | 18 | Copper channel loss | 2.125,00 | 200-Delta-Cu-3dB | Loss Measured at ½ the Baudrate | 3dB Loss for copper channel |
| 6 | 19 | Copper channel loss | 2.125,00 | 200-Delta-Cu-3.75dB | Loss Measured at ½ the Baudrate | 3.75dB Loss for copper channel |
| 6 | 1A | Copper channel loss | 2.125,00 | 200-Delta-Cu-4.5dB | Loss Measured at ½ the Baudrate | 4.5dB Loss for copper channel |
| 6 | 1B | Copper channel loss | 2.125,00 | 200-Delta-Cu-5.25dB | Loss Measured at ½ the Baudrate | 5.25dB Loss for copper channel |
| 6 | 1C | Copper channel loss | 2.125,00 | 200-Delta-Cu-6dB | Loss Measured at ½ the Baudrate | 6dB Loss for copper channel |
| 6 | 1D | Copper channel loss | 2.125,00 | 200-Delta-Cu-6.75dB | Loss Measured at ½ the Baudrate | 6.75dB Loss for copper channel |
| 6 | 1E | Copper channel loss | 2.125,00 | 200-Delta-Cu-7.5dB | Loss Measured at ½ the Baudrate | 7.5dB Loss for copper channel |
| 6 | 1F | Copper channel loss | 2.125,00 | 200-Delta-Cu-8.25dB | Loss Measured at ½ the Baudrate | 8.25dB Loss for copper channel |
| 6 | 20 | Copper channel loss | 2.125,00 | 200-Delta-Cu-9dB | Loss Measured at ½ the Baudrate | 9dB Loss for copper channel |
| 6 | 21 | Copper channel loss | 2.125,00 | 200-Delta-Cu-9.75dB | Loss Measured at ½ the Baudrate | 9.75dB Loss for copper channel |
| 6 | 22 | Copper channel loss | 2.125,00 | 200-Delta-Cu-10.5dB | Loss Measured at ½ the Baudrate | 10.5dB Loss for copper channel |

| Byte 1# (hex) | Byte 2# (hex) | Category | Variant | | Description | |
|---|---|---|---|---|---|---|
| | | Standard | Bit Rate [Mb/s] | Variant | According to | Comment |
| 6 | 23 | Copper channel loss | 2.125,00 | 200-Delta-Cu-11.25dB | Loss Measured at ½ the Baudrate | 11.25dB Loss for copper channel |
| 6 | 24-28 | Copper channel loss | 2.125,00 | *RFU* | | Reserved for future Use |
| 6 | 29 | Copper channel loss | 4.250,00 | 400-Delta-Cu-1dB | Loss Measured at ½ the Baudrate | 1dB Loss for copper channel |
| 6 | 2A | Copper channel loss | 4.250,00 | 400-Delta-Cu-2dB | Loss Measured at ½ the Baudrate | 2dB Loss for copper channel |
| 6 | 2B | Copper channel loss | 4.250,00 | 400-Delta-Cu-3dB | Loss Measured at ½ the Baudrate | 3dB Loss for copper channel |
| 6 | 2C | Copper channel loss | 4.250,00 | 400-Delta-Cu-4dB | Loss Measured at ½ the Baudrate | 4dB Loss for copper channel |
| 6 | 2D | Copper channel loss | 4.250,00 | 400-Delta-Cu-5dB | Loss Measured at ½ the Baudrate | 5dB Loss for copper channel |
| 6 | 2E | Copper channel loss | 4.250,00 | 400-Delta-Cu-6dB | Loss Measured at ½ the Baudrate | 6dB Loss for copper channel |
| 6 | 2F | Copper channel loss | 4.250,00 | 400-Delta-Cu-7dB | Loss Measured at ½ the Baudrate | 7dB Loss for copper channel |
| 6 | 30 | Copper channel loss | 4.250,00 | 400-Delta-Cu-8dB | Loss Measured at ½ the Baudrate | 8dB Loss for copper channel |
| 6 | 31 | Copper channel loss | 4.250,00 | 400-Delta-Cu-9dB | Loss Measured at ½ the Baudrate | 9dB Loss for copper channel |
| 6 | 32 | Copper channel loss | 4.250,00 | 400-Delta-Cu-10dB | Loss Measured at ½ the Baudrate | 10dB Loss for copper channel |
| 6 | 33 | Copper channel loss | 4.250,00 | 400-Delta-Cu-11dB | Loss Measured at ½ the Baudrate | 11dB Loss for copper channel |
| 6 | 34 | Copper channel loss | 4.250,00 | 400-Delta-Cu-12dB | Loss Measured at ½ the Baudrate | 12dB Loss for copper channel |
| 6 | 35 | Copper channel loss | 4.250,00 | 400-Delta-Cu-13dB | Loss Measured at ½ the Baudrate | 13dB Loss for copper channel |
| 6 | 36 | Copper channel loss | 4.250,00 | 400-Delta-Cu-14dB | Loss Measured at ½ the Baudrate | 14dB Loss for copper channel |
| 6 | 37 | Copper channel loss | 4.250,00 | 400-Delta-Cu-15dB | Loss Measured at ½ the Baudrate | 15dB Loss for copper channel |
| 6 | 38-FF | Copper channel loss | *RFU* | | | Reserved for future Use |
| 7-20 | 00-FF | RFU | | | | Reserved for future Use |

### 4.3 Copper SFP implementation overview

This section defines non-standardized extensions to SFF-8079 to enable application-dependent customization of a host's SerDes or Retimer outputs to drive a passive SFP with an attached copper cable. The host system will read the SFP registers and set an optimum pre-emphasis level, based on pre-determined loss properties of the cable, to drive the assembly without the need of additional equalization. The default setting for host pre-emphasis level is "off", appropriate to drive an optical module.

Table 4-1 Byte 1# value 6h stores a code that specifies the copper SFP assembly's loss data at ½ the baudrate of its highest designed baudrate of operation. A cable assembly designed for 4.25 Gbd shall also store loss data for 1.0625 Gbd and 2.125 Gbd, as this will improve the resolution for pre-emphasis and support operation at multiple data rates. A new cable assembly designed for 2.125 Gbd shall also store loss data for 1.0625 Gbd. A cable assembly designed for lower baudrates does not need to store loss data for higher baudrates. A cable assembly designed for 2.125 Gbd or 4.25 Gbd shall have a maximum frequency response deviation at the specified frequencies of +/-0.5 dB.