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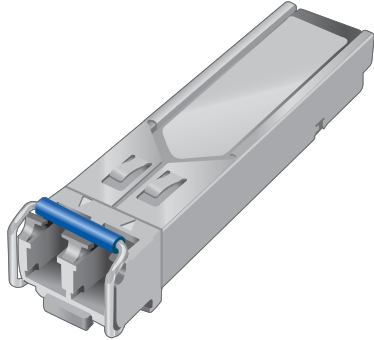
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Registration is required.

ADTRAN offers training courses on our products, including customized training and courses taught at our facilities or at customer sites.

For inquiries, go to: <http://adtran.com/training>

The following online documents and resources provide additional information for this product: SFP/XFP/SFP+ Compatibility Matrix (online tool, go to: <http://www.adtran.com/sfp>)



DESCRIPTION

The Small Form-factor Pluggable 9.95 -11.3G, Single-Mode, 10km, optical transceiver is a fully duplex serial electric, serial optical device with both transmit and receive functions contained in a single module that provides a high speed serial link at 10 Gbps. Installed into an appropriate host module, the SFP+ provides a 10 Gbps interface to the supporting system.

The transmit side of the SFP+ converts serial NRZ electrical data at the 10 Gbps line rate to a standard compliant optical signal. The receive side of the SFP+ converts the incoming DC balanced serial NRZ optical data at the 10 Gbps line rate into serial electrical data.

The following features are supported on the SFP+:

- 1310 nm optical signals for up to 10 km
- Bit error rate ($<1 \times 10^{-12}$)
- Excellent EMI performance

⚠ CAUTION

Due to compliance certification requirements, only SFPs supplied by ADTRAN are to be used with ADTRAN modules. ADTRAN cannot certify system integrity with other SFPs.

Specifications

General

- Module type: SFP+
 - ◆ Fiber/Copper: Fiber
 - ◆ Single/Dual: Dual
 - ◆ Direction: Duplex
- Signal Datarate: 9.953Gbps to 11.317Gbps
- Optical Connector: LC
- Applications:
 - ◆ 10G Base-LR/LW
 - ◆ 10G Ethernet
 - ◆ 10G Fiber Channel
 - ◆ SDH STM64
- Distance: 10 km maximum
- Power: 1.5W max

Optical

- Transmitter
 - ◆ Laser Diode Type: DFB
 - ◆ Tx Central Wavelength: 1310 nm
 - ◆ Tx Output optical power: -6.0 dBm to +0.5 dBm
 - ◆ Tx Spectral width: 1nm Max
 - ◆ SMSR: <30 dB
 - ◆ Extinction Ratio: 5 dB
 - ◆ Optical Rise time (tr): 28 ps
 - ◆ Optical Fall time (tf): 28 ps
- Receiver
 - ◆ Rx Type: PIN
 - ◆ Rx Central wavelength: 1310 nm
 - ◆ Output Eye: ITU-TG.691SDHSTM-64I-64.1Compatible
 - ◆ Receive Overload: +0.5 dBm
 - ◆ Receiver Sensitivity: -14.4 dBm

Environmental

- Controlled Protected Environment (Inside)
 - ◆ Operational temperature range: -5°C to +50°C
 - ◆ Storage temperature range: -40°C to +85°C
 - ◆ Relative humidity: 5 to 85%, noncondensing

INSTALLATION

Before installing the equipment, inspect the SFP+. If damage has occurred during shipping, file a claim with the carrier, and then contact ADTRAN Customer Support. For more information, refer to the warranty.

To install the SFP+ into an appropriate module, complete the following steps:

NOTE

Do not remove the protective end cap from the SFP+ until the fiber optic cable is ready to be connected.

1. Insert the SFP+ into the SFP+ cage on the module. Ensuring that the latch handle on the SFP+ is facing upward, slide the SFP+ all the way into the SFP+ cage until there is an audible “click”.

NOTE

The latch on the SFP+ is for removal only. When removing the SFP+, rotate the latch away from the SFP+, the SFP+ should easily slide out of the cage.

2. Remove the end cap and connect the fiber to the SFP+.

NOTICE

It is recommended that the protective end cap remain on whenever the transceiver optical fiber connector is not inserted.

3. Continue the installation and turn-up of the host module using the instructions in the Job Aid provided with the module or other system-level documentation available online at www.adtran.com.

SAFETY AND REGULATORY COMPLIANCE

WARNING

Read all warnings and cautions before installing or servicing this equipment.

CAUTION

This product uses a Class 1 Laser module that complies with 21 CFR 1040.10 and 1040.11 and IEC 60825-1, IEC 60825-2, EN 60825-1 and EN 60825-2. For continued compliance with the above standards, only approved Class 1 laser modules from an ADTRAN approved vendor list (located on the ADTRAN website) should be installed in this product. ADTRAN cannot certify system integrity with other laser modules.

CAUTION

- Electrostatic Discharge (ESD) can damage electronic modules. When handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.
- Per GR-1089-CORE the system is designed and intended for installation as part of a Common Bonding Network (CBN). The system is not designed nor intended for installation as part of an Isolated Bonding Network (IBN).

- Per GR-1089-CORE Section 9, this product does not have an internal DC connection between battery return and frame ground. This product can be installed in a DC-I (isolated) or DC-C (common) installation. For installations where other cards or the host system have internal connections between battery return and frame ground, the system would be intended for deployment only in a DC-C installation.
- The chassis frame ground terminal must be connected to an earth ground to ensure that the metal enclosure of the SFP is properly grounded via the backplane connector.

NOTE

- The Gigabit Ethernet port(s) are optical and therefore are not classified as any type of port as defined in Appendix B of GR-1089-CORE.
- This product is compliant with SFF-8472 “Digital Diagnostics Monitoring Interface for Optical Transceivers,” Revision 9.3.
- This product is compliant with the SFP Multi-Source Agreement (MSA).
- This product is designed to be deployed in GR-3108-CORE environmental class 1 or 2 as defined in GR-3108-CORE.

This product meets or exceeds all the applicable requirements of NEBS, Telcordia GR-63-CORE, GR-1089-CORE, and ETSI EN 300368. This product is intended for deployment in Central Office type facilities, EEEs, EECs, and locations where the NEC applies (for example, Customer Premises).

This product is to be installed in ADTRAN products in Restricted Access Locations only, and installed by trained service personnel.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by ADTRAN could void the user's authority to operate this equipment.

This product is designed to meet the following environmental classes:

- ETSI EN 300 019-1-1: “Classification of environmental conditions; Storage,” Class 1.2
- ETSI EN 300 019-1-2: “Classification of environmental conditions; Transportation,” Class 2.3
- ETSI EN 300 019-1-3: “Classification of environmental conditions; Stationary use at weather-protected locations,” Class 3.2 or 3.3

The equipment is designed to function without degradation during exposure to all test severities per Class 3.2 of ETSI EN 300 019-1-3.

This product meets EU RoHS Directive 2011/65/EU and/or applicable exemptions. Refer to www.adtran.com for further information on RoHS/WEEE.

FRANÇAIS

⚠ AVERTISSEMENT

Lisez tous les avertissements et mises en garde avant l'installation de cet équipement ou la réalisation de toute opération de maintenance.

⚠ ATTENTION

Ce produit utilise un module laser de classe 1 qui conforme aux normes 21 CFR 1040.10, 1040.11 et IEC 60825-1 et -2. Pour assurer la conformité aux normes mentionnées plus haut, seuls des modules laser de classe 1 approuvés provenant d'une liste de fournisseurs certifiés par ADTRAN (disponible sur le site d'ADTRAN) doivent être installés sur ce produit. ADTRAN ne peut certifier l'intégrité d'un système doté d'autres modules laser.

⚠ ATTENTION

- L'ESD (décharge électrostatique) peut endommager les modules électroniques. Lors de la manipulation des modules, portez un bracelet de décharge antistatique pour éviter d'endommager les composants électroniques. Placez les modules dans un emballage antistatique lors du transport ou du stockage. Lorsque vous travaillez sur les modules, placez-les toujours sur un tapis antistatique certifié muni d'un branchement de mise à la terre.
- La borne de mise à la terre du châssis doit être branchée à une prise de terre afin d'assurer que le boîtier métallique de la SFP est correctement mis à la terre grâce au connecteur de face arrière.

Ce produit est conçu pour répondre aux classes environnementales suivantes :

- ETSI EN 300 019-1-1: "Classification des conditions d'environnement; Entreposage," classe 1.2
- ETSI EN 300 019-1-2: "Classification des conditions d'environnements; Transport," classe 2.3
- ETSI EN 300 019-1-3: "Classification des conditions d'environnements; l'utilisation à poste fixe dans des endroits protégés contre les intempéries," classe 3.2 or 3.3.

L'équipement est conçu pour fonctionner sans dégradation lors des tests à tous les niveaux de sévérité, suivant les spécifications de la classe 3.3 de l'ETSI EN 300 019-1-3.

Ce produit est conforme à la directive européenne RoHS 2011/65/EU et/ou aux exonérations applicables. Reportez-vous à www.adtran.com pour de plus amples renseignements sur RoHS/WEEE.

DEUTSCH

⚠ WARNUNG

Lesen Sie sich alle Warn- und Sicherheitshinweise durch, bevor Sie dieses Gerät installieren oder warten.

⚠ VORSICHT

Dieses Produkt nutzt ein mit den Richtlinien 21 CFR 1040.10 und 1040.11 und IEC 60825-1 und -2 konformes Class 1 Lasermodul. Damit die obigen Richtlinien auch in Zukunft eingehalten werden können, dürfen ausschließlich Class 1 Lasermodule von einem von ADTRAN zugelassenen Anbieter in dem Produkt installiert werden (erhältlich auf der Website von ADTRAN). ADTRAN garantiert nicht für die Systemintegrität bei anderen Lasermodulen.

⚠ VORSICHT

- Elektrostatische Entladungen können elektronische Module beschädigen. Tragen Sie beim Umgang mit Modulen ein Erdungsarmband, um Schäden an den elektronischen Komponenten zu vermeiden. Transportieren oder lagern Sie Module in antistatischem Verpackungsmaterial. Bei der Arbeit an den Modulen, achten Sie darauf, diese stets auf antistatische, elektrisch geerdete Matten zu legen.
- Die Erdungsschiene des Rahmens muss an eine Bodenstation angeschlossen werden, um sicherzustellen, dass das Metallgehäuse des SFP vorschriftsmäßig über den Rückwandanschluss geerdet ist.

Dieses Produkt wurde entsprechend der folgenden Umweltkassen entwickelt:

- ETSI EN 300 019-1-1: "Klassifikation von Umweltbedingungen, Lagerung," Klasse 1.2
- ETSI EN 300 019-1-2: "Klassifikation von Umweltbedingungen, Transport," Klasse 2.3
- ETSI EN 300 019-1-3: "Klassifikation von Umweltbedingungen, Stationärer Einsatz ohne Witterungseinflüsse," Klasse 3.2 or 3.3.

Dieses Gerät funktioniert ohne Leistungsabfall während aller für Klasse 3.3 von ETSI EN 300 019-1-3 vorgeschriebenen Belastungstests.

Dieses Produkt erfüllt die EU RoHS Richtlinie 2011/65/EU und/oder gültige Ausnahmen. Bitte besuchen Sie www.adtran.com für ausführlichere Informationen zu RoHS/WEEE.



Warranty: ADTRAN will replace or repair this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found online at www.adtran.com/warranty.

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