

Documentation for ADTRAN Carrier Networks products is available for viewing and download directly from the ADTRAN Support Community website.

Go to: <https://supportforums.adtran.com/welcome>

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



The following features are supported on the SFP+:

- 9.95 to 11.3 Gbps, single-fiber operation
- 60 km maximum optical span

**NOTE**

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

**DESCRIPTION**

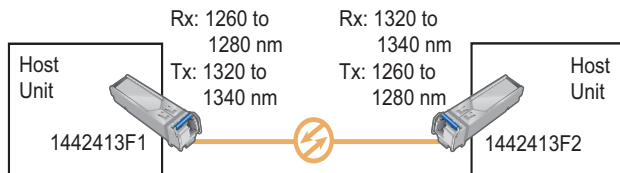
The SFP+, 11.3 Gbps, BIDI, 60 km module (SFP+, P/N 1442413F1) provides bidirectional serial optical data communications up to 60KM when paired with its counterpart, SFP+, 11.3 Gbps, BIDI, 60 km module (SFP+, P/N 1442412F2). The SFP+ plugs into ADTRAN equipment designed to accept Small Form-factor Pluggables (SFPs). Installed into an appropriate host unit, the SFP+ provides a 10 Gbps optical interface to the supporting system.

**CAUTION**

Maintain a minimum attenuation for 60 km modules to ensure safe operation of the device pair. The TX power can be more than the RX sensitivity for 60 km modules.

**NOTE**

- The 1442413F1 and 1442413F2 must be deployed as pairs at each end of the network. The 1442413F1 must be connected to the 1442413F2 at the other end of the fiber.



- To ensure compatibility, refer to the documentation provided with the host module.

**SPECIFICATIONS**

**General**

- Power: Less than 1.2 W

**Optical**

- TX Wavelength: 1320 to 1340 nm
- RX Wavelength: 1260 to 1280 nm
- Data Rate: 9.95 to 11.3 Gbps
- Optical Transmit Level: 0 dBm to +5.0 dBm
- Optical Receive Level: -20.0 dBm to -7.0 dBm
- Spectral Width: 1 nm maximum (-20.0 dB Spectral Width)
- Extinction Ratio: 3.5 dB minimum
- SMSR: 30 dB minimum
- Power Penalty: 1 dB
- Optical Budget: 19.0 dB
- Minimum Span Attenuation: 15 dB
- Optical Span: 60 km
- Optical Connectors: LC

**Environmental**

- **Protected Equipment Severe Environment (Outside)**
  - ◆ Operational Temperature Range: -40°C to +65°C
    - Case temperature hardened range: -40°C to +85°C
  - ◆ Storage Temperature Range: -40°C to +85°C
  - ◆ Relative humidity 5 to 90%

## 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 you are ready to connect the fiber optic cable.

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

We recommend that you keep the protective end cap on whenever the transceiver optical fiber connector is not in use.

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](http://www.adtran.com).

## SAFETY AND REGULATORY COMPLIANCE

### ⚠ WARNING

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

### ⚠ CAUTION

This product is a Class 1 Laser module that complies with FDA 21 CFR 1040.10, 1040.11 and IEC 60825-1. The product is NRTL Listed and CB Certified to all applicable American and European safety standards.

### ⚠ 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.
- This product and host system are designed and intended for installation as part of either a Common Bonding Network (CBN) or 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) configuration. 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 SFP+ 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, 2, and 3 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).

Install this product in a Restricted Access Location. This product is intended to be installed and serviced by qualified Service Personnel only.

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

The equipment is designed to function without degradation during exposure to all test severities per Class 3.3 of ETSI EN 300 019-2-3.

The SFP+ meets EU RoHS Directive 2011/65/EU and/or applicable exemptions. Refer to [www.adtran.com](http://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 est un laser de classe 1 conforme à la norme FDA 21 CFR 1040.10 et 1040.11 et IEC 60825-1. Le produit est NRTL et CB certifiée à toutes les normes de sûreté américaines et européennes.

### CAUTION

- Une 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 3.3

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.

Cet appareil est conforme à la norme ETSI EN 300 386 " Compatibilité électromagnétique et spectre radioélectrique (ERM); équipement des réseaux de télécommunications; exigences en matière de compatibilité électromagnétique (CEM).

Ce produit est conforme à la directive européenne RoHS 2011/65/EU et/ou aux exonérations applicables. Reportez-vous à [www.adtran.com](http://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 ist ein Klasse 1 Laser, die mit FDA 21 CFR 1040.10 und 1040.11 und IEC 60825-1 entspricht. Das Produkt ist NRTL gelistet und CB Certified allen geltenden amerikanischen und europäischen Sicherheitsnormen.

### CAUTION

- Elektrostatische Entladung 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 3.3

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

Dieses Produkt erfüllt die ETSI EN 300 386 Norm Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM); Einrichtungen des Telekommunikationsnetzes; Anforderungen zur elektromagnetischen Verträglichkeit.

Dieses Produkt erfüllt die EU RoHS Richtlinie 2011/65/EU und/oder gültige Ausnahmen. Bitte besuchen Sie [www.adtran.com](http://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](http://www.adtran.com/warranty).

©2016 ADTRAN, Inc. All Rights Reserved.



**ADTRAN CUSTOMER CARE:**  
From within the U.S. 1.888.423.8726  
From outside the U.S. +1 256.963.8716  
**PRICING AND AVAILABILITY 1.800.827.0807**



\* 6 1 4 4 2 4 1 3 F 1 - 2 2 A \*