ADTRAN®

Small Form-factor Pluggable
9.95 to 11.3 Gbps, DWDM, Tunable, 80 km SFP+

jobAid +

Product P/N: 1442496F2C

Issue Date: May 2016
Document P/N: 61442496F2C-22A

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 0nline documents and resources provide additional information for this product: *SFP/XFP/SFP+ Compatibility Matrix* (online tool, go to: http://www.adtran.com/sfp)
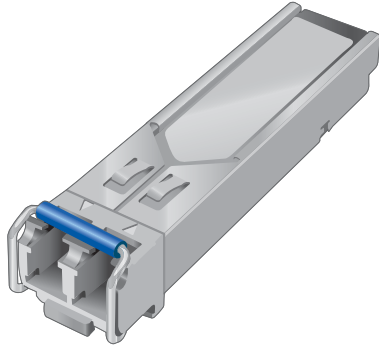
DESCRIPTION

The 9.95 to 11.3 Gbps, DWDM, Tunable, 80 km SFP+ is a fully duplex serial electric, serial optic device with both transmit and receive functions contained in a single module that provides a high speed serial link at a nominal rate of 10 Gbps. The Tunable SFP+ is controlled by software on the host module and can operate on the C-band, supporting Channels 17 through 60. Installed in the appropriate host module, the Tunable SFP+ provides a 9.95 to 11.3 Gbps interface to the supporting system. Refer to the documentation provided with the host module for information on configuring the SFP+.

The transmit side of the Tunable SFP+ converts serial NRZ electrical data at the 9.95 to 11.3 Gbps line rate to a standard compliant optical signal. The receive side converts the incoming DC balanced, serial NRZ optical data at the 9.95 to 11.3 Gbps line rate into serial electrical data.

NOTE

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

FEATURES

The following features are supported on the SFP+:

- 1529.55 ~ 1563.86 nm optical signals for up to 80 km reach
- Low power consumption (<1.7 W max)
- Bit error rate 10^{-12}

⚠ **CAUTION**

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

INSTALLATION

Before installation, 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 "Warranty".

Installation Guidelines

The following are guidelines for this installation.

- The latch on the SFP+ is for removal only. When removing the SFP+, rotate the latch away from the SFP+. The SFP+ should slide easily out of the cage.
- It is recommended that the protective dust cover remain on whenever the transceiver optical fiber connector is not inserted.

Installation Steps

To install the SFP+, complete the following steps:

1. Insert the SFP+ into the SFP+ cage on the circuit board of the host module with the latch handle facing outward. Slide the SFP+ all the way into the cage.
2. Exert adequate pressure to ensure the SFP+ is completely seated in the SFP+ cage.
3. Do not remove the protective dust cover until the optical fiber connection is made.
4. Continue the installation and turn-up of the host module.

SPECIFICATIONS

- General
  - Power Dissipation: 1.7 W
  - Data Rate: 9.95 Gbps to 11.3 Gbps
  - Optical connectors: LC
  - (Channels 17 through 60)
  - Channel Spacing: 100 GHz
- Optical
  - Dispersion Tolerance: –400ps/nm to 1600ps/nm
  - Dispersion penalty maximum: 3.0dB (–400 to 1600ps/nm)
  - Minimum Span Attenuation: 10.0 dB
  - Optical distance: 80 km maximum
  - OSNR Characteristics with External CDR: (See Table)

Parameter	Max	Units
OSNR Tolerance (EOL), Fixed RxDTV, non-FEC rates (9.95G, 10.3G, 10.5G)		
Back to back, 1E–12, –7.0 dBm to –19.0 dBm	24.0	dB
–400ps/nm to +1600ps/nm, 1E–12, –7.0 dBm to –19.0 dBm	26.0	dB
OSNR Tolerance (EOL), Fixed RxDTV, FEC rate 10.709G ~11.09G		
Back to back, 1E–4, –7.0 dBm to –19.0 dBm	15	dB
–400ps/nm to +1600ps/nm, 1E–4, –7.0 dBm to –19.0 dBm	18	dB

  - Transmitter
    - Transmit Wavelength: Tunable 1529.55 ~ 1563.86 nm
    - Optical transmit levels: –1.0 to +3.0 dBm
  - Receiver
    - Receive Wavelength: 1260 to 1600 nm
    - Optical receive level: –23.0 to –7.0 dBm
  - 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

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 and -2. For continued compliance with the above standards, install only ADTRAN-approved Class 1 Laser Modules in this product. For a list of ADTRAN-approved SFPs and XFPs, see adtran.com>support>support community>search *SFP/XFP*. 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.
- This product is intended for deployment in CO Type Facilities 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.
- Per GR-1089-CORE the ADTRAN system that this product is being deployed in is designed and intended for installation as part of a Common Bonding Network (CBN). The ADTRAN system that this product is being deployed in 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 ADTRAN system chassis frame ground terminal must be connected to a reliable earth ground to ensure that the metal enclosure of this product 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 designed to be deployed in GR-3108-CORE environmental Class 1.

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 3.3

The equipment is designed to function without degradation during exposure to all test severities per Class 3.3.

This product meets EU RoHS Directive RoHS 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.

- Installation du produit dans un emplacement à accès restreint. Ce produit a été conçu pour être installé et entretenu exclusivement par un personnel de service qualifié.

- 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.

Les changements ou modifications non expressément approuvés par ADTRAN pourraient annuler l'autorisation de l'utilisateur d'utiliser cet équipement.

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.

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.

- Installieren Sie dieses Produkt an einem nicht öffentlich zugänglichen Ort. Dieses Produkt darf ausschließlich von qualifiziertem Bedienungspersonal installiert und gewartet werden.

- Die Erdungsschiene des Rahmens muss an eine Bodenstation angeschlossen werden, um sicherzustellen, dass das Metallgehäuse des SFP vorschriftsmäßig über den Rückwandanschluss geerdet ist.

Durch Änderungen oder Umbauten, die von ADTRAN nicht ausdrücklich genehmigt wurden, kann der Nutzer die Berechtigung zur Bedienung dieses Geräts verlieren.

Dieses Produkt wurde entsprechend der folgenden Umwelt-klassen 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 EU RoHS Richtlinie 2011/65/EU und/oder gültige Ausnahmen. Bitte besuchen Sie www.adtran.com für ausführlichere Informationen zu RoHS/WEEE.

C A U T I O N !

SUBJECT TO ELECTROSTATIC DAMAGE
OR DECREASE IN RELIABILITY.
HANDLING PRECAUTIONS
REQUIRED.

ADTRAN CUSTOMER CARE:

From within the U.S.   1.800.726.8663
From outside the U.S. +1 256.963.8716

PRICING AND AVAILABILITY 1.800.827.0807

61442496F2C-22A