50 MHz to 3000 MHz
Pluggable XFP-RF Transmitter

Wavelength tunable, 3 GHz pluggable optical transmitter module

Overview

Finisar’s XFP-RF transmitter is a small form factor hot-pluggable optical module that is compliant with interface specifications developed by the Society of Cable Telecommunications Engineers (SCTE). It can be fully loaded with analog carriers from 50 MHz to 3000 MHz in order to enable operators to effectively utilize a broad range of frequencies when designing distributed antenna systems and RF Over Fiber networks. The small XFP module significantly reduces power consumption and increases density for downstream transmitters.

The transmitter wavelength can be tuned to any of the 43 different Dense Wavelength Division Multiplexing (DWDM) wavelengths across the entire C-band in less than 500 ms. This increases operational efficiencies in deploying DWDM networks and reduces inventory of transmitters at different fixed wavelengths. Wavelength tunability also opens the possibility of novel HFC architectures that can dynamically route services and increase bandwidth capacity in the cable operator’s access network.

Key Advantages

- 2x to 4x density improvement over current transmitter solutions
- At least 50% less power consumption per transmitter
- Enables future HFC architectures to route services dynamically by changing the wavelength of the transmitter
- Enables pluggable optics to be utilized directly in next-generation Cable Modem Termination Systems and QAM modulators

Applications

- Antenna Remoting
- Distributed Antenna Systems (DAS) to Extend Wireless Infrastructure
- 1550nm Broadcast with DWDM Narrowcast Overlay architectures
- All-Digital QAM networks

Key Features

- Analog Carrier Loading from 50 MHz to 3000 MHz
- Wavelengths can tuned across the entire C-band at 100 GHz ITU DWDM spacings
- Tunes to different wavelength in less than 0.5 seconds
- Packaged in standard XFP pluggable optical module
- Built-in digital diagnostic functions
- Link distance up to 15 kilometers
- LC/APC optical connection
- Power consumption less than 3.5 Watts
- Operating temperature range of 0°C to 65°C
- Compliant with SCTE 195 2013: Interface Specifications for an RF-Modulated Small Form Factor Pluggable Optical Module
- Mechanical dimensions compliant with 10 Gigabit Small Form Factor Pluggable Module (XFP) Multi-Source Agreement (INF-8077i, Rev. 4.5)
## Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical Output Power</td>
<td>4 dBm minimum</td>
</tr>
<tr>
<td>Optical Wavelengths</td>
<td>ITU DWDM Channels 18 to 60 (1528.77 nm to 1529.55 nm)</td>
</tr>
<tr>
<td>Center Wavelength Spacing</td>
<td>100 GHz</td>
</tr>
<tr>
<td>Wavelength Tuning Time</td>
<td>0.5 seconds maximum</td>
</tr>
<tr>
<td>Optical Connection</td>
<td>LC/APC receptacle</td>
</tr>
<tr>
<td>Optical Fiber Distance</td>
<td>0 km to 15 km</td>
</tr>
<tr>
<td>Fiber Dispersion Compensation, Internal or External</td>
<td>Not applicable</td>
</tr>
<tr>
<td>SBS Suppression</td>
<td>+12 typical, with optical amplifier</td>
</tr>
<tr>
<td>RF Bandwidth</td>
<td>50 MHz to 3000 MHz</td>
</tr>
<tr>
<td>Link Gain*</td>
<td>&gt;0 dB, 50 MHz to 3000 MHz</td>
</tr>
<tr>
<td>Noise Figure*</td>
<td>&lt;28 dB, 50 MHz to 2200 MHz; &lt;30 dB, 2200 MHz to 3000 MHz</td>
</tr>
<tr>
<td>SFDR (3rds)*</td>
<td>&gt;108 dB/Hz, 50 MHz to 2200 MHz; &gt;103 dB/Hz, 2200 MHz to 3000 MHz</td>
</tr>
<tr>
<td>IIP3*</td>
<td>&gt;8 dB, 50 MHz to 2200 MHz; &gt;6 dB, 2200 MHz to 3000 MHz</td>
</tr>
<tr>
<td>RF Input Level</td>
<td>Dependent on host module (-20 dBm composite into XFP-RF)</td>
</tr>
<tr>
<td>RF Impedance</td>
<td>Dependent on host module (100 Ω differential or 50 Ω single-ended into XFP-RF)</td>
</tr>
<tr>
<td>RF Flatness</td>
<td>2.0 dB max, peak to peak, 50 MHz to 3000 MHz</td>
</tr>
<tr>
<td>RF Input Return Loss</td>
<td>10 dB min, 50 MHz to 3000 MHz</td>
</tr>
<tr>
<td>Dimensions</td>
<td>78 mm (L) X 18.35 mm (W) X 8.5 mm (H)</td>
</tr>
<tr>
<td></td>
<td>3.0 in (L) X 0.7 in (W) X 0.3 in (H)</td>
</tr>
<tr>
<td>Mounting</td>
<td>XFP cage assembly on host module</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>0°C to 65°C</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>-40°C to 85°C</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>3.5 Watts maximum</td>
</tr>
<tr>
<td>Data/Control</td>
<td>Digital diagnostic functions via two-wire serial interface</td>
</tr>
</tbody>
</table>

*With Finisar Optical Receiver. 1 km of SMF-28 single-mode fiber. Host system or chassis may degrade performance.

## Product Selection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XT04AARTENJD1860</td>
<td>XFP-RF Pluggable Tx, Wavelength-Tunable, 50 MHz to 3000 MHz, +4 dBm</td>
</tr>
<tr>
<td>XT04AAR5ENJDxxx</td>
<td>XFP-RF Pluggable Tx, Fixed Wavelength, 50 MHz to 3000 MHz, +4 dBm</td>
</tr>
</tbody>
</table>

xxx – fixed wavelength designated with ITU DWDM channel number