

## MiniPOD™

### AFBR-811VxyZ, AFBR-821VxyZ

10 Gbps/Channel

Twelve Channel, Parallel Fiber Optics Modules



## Product Brief

### Description

The AFBR-811VxyZ Twelve Channel, Pluggable, Parallel Fiber Optics Transmitter and AFBR-821VxyZ Twelve Channel, Pluggable, Parallel Fiber Optics Receiver are high performance fiber optics modules for short-range parallel multi-lane data communication and interconnect applications. The high density optical modules are designed to operate over multimode fiber systems using a nominal wavelength of 850 nm.

Avago's MiniPOD solution offers system designers two module package options to optimize their cable management and board layout. AFBR-811RxyZ Tx/AFBR-821RxyZ Rx is used with round multi-lane cable assemblies for applications requiring multiple turns of the jumper cable inside the chassis. AFBR-811FxyZ Tx/AFBR-821FxyZ Rx is used with flat ribbon cable assemblies, allowing dense tiling of the modules as the jumper cables can be thread under the dust-cap of the next module. This top mounted optical connection maximizes board layout density by eliminating board space lost to the optical connector and strain relief.

The electrical interface uses a 9x9 MEG-Array connector with 1.27 mm pitch

<http://portal.fciconnect.com/Comergent//fci/drawing/55714.pdf>

The optical interface requires the user to provide a custom designed optical turn 1x12 ribbon cable PRIZM® LightTurn® connector.

The thermal interface provided can require either a user provided heat sink or use of the Avago general purpose clip on heat sink, to maintain the module case temperature to be between 0 °C to 70 °C during continuous operation.

### Applications

- 100 GbE and IB-QDR / IB-DDR / IB-SDR interconnects
- Data Aggregation, Backplane and Proprietary Protocol and Density Applications
- High Performance and High Productivity computer interconnects
- Switch Fabric interconnects

Patent - [www.avagotech.com/patents](http://www.avagotech.com/patents)

### Features

- Compliant to IEEE 802.3ba 100GbE (100GBASE-SR10 and nPPI) per lane
- Compliant to 12xQDR Infiniband
- Operates at 10.3125 Gbps per channel with 64b/66b encoded data for 100GbE application and at 10 Gbps with 8b/10b encoded data for IB-QDR application
- High Aggregate bandwidth: 120 Gbps per module
- High density footprint: 21.95 mm x 18.62 mm size
- Two package options to optimize internal cable management and system layout
- Separate transmitter and receiver modules
- 850 nm VCSEL array in transmitter; PIN array in receiver
- Links up to 150 m at 10.3125 Gbps with OM4 4700 MHz·km 50 µm MMF
- Optical Interface: PRIZM® LightTurn® optical turn 1x12 ribbon fiber connector
- Pluggable electrical interface: 9x9 MEG-Array for ease of design and manufacturability
- Low Power consumption: 3.0 W Max per Transmitter/Receiver pair (0 °C to 70 °C operating range)
- Dedicated signals for module address, module reset and host interrupt
- Two Wire Serial (TWS) interface with maskable interrupt for expanded functionality including:
  - Individual channel functions: disable, squelch disable, lane polarity inversion, TX eye margin enable
  - A/D read back: module temperature and supply voltages, per channel laser current and laser power, or received power
  - Status: per channel Tx fault, electrical (transmitter) or optical (receiver) LOS, and alarm flags
  - Programmable equalization integrated with DC blocking caps at transmitter data input
  - Programmable receiver output swing and de-emphasis level
  - Field Upgradable Firmware capability
- 0 °C to 70 °C case temperature continuous operating range. 85 °C supported for short durations

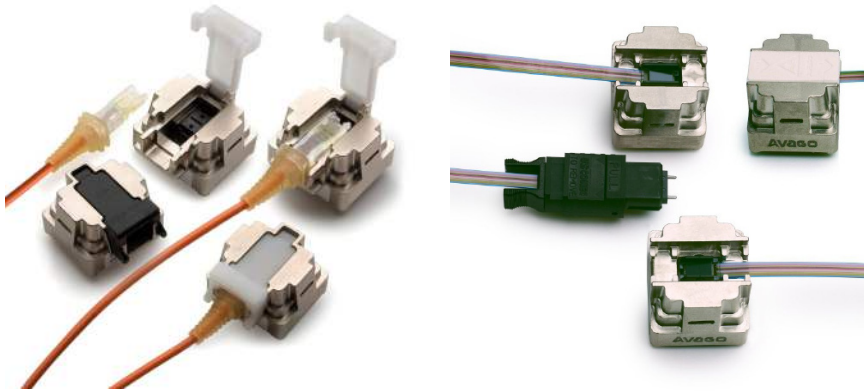


Figure 1. MiniPOD™ Transmitter and Receiver Modules with a) Round Cable and b) Flat Cable: shown with and without dust covers (White = Tx, Black = Rx).

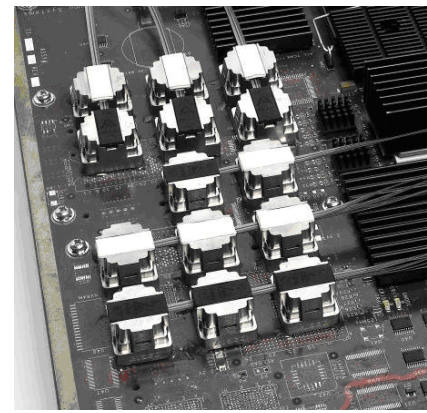


Figure 2. MiniPOD™ Transmitter and Receiver flat ribbon cable modules in a tiled arrangement example.

### Part Number Ordering Options

<b>Modules for use with Flat Ribbon Jumper Cable</b>	Transmitter Base Part Number	AFBR-811FxyZ
	Receiver Base Part Number	AFBR-821FxyZ
<b>Modules for use with Round Jumper Cable</b>	Transmitter Base Part Number	AFBR-811RxyZ
	Receiver Base Part Number	AFBR-821RxyZ

Where:

81 = Transmitter; 82 = Receiver

F/R: R = module package for use with round cable;

F = module package for use with Flat ribbon cable

V: R= module package for use with round cable; F = module package for use with Flat ribbon cable

x: N = No Heat Sink, H = Pin Clip-on Heat Sink attached

Y: 1 = 100m

### Key Product Parameters

The Avago Technologies MiniPOD™ modules operate at 850 nm and are compliant to the Multi-mode Fiber optical specs in clause 86 and relevant electrical specs in annex 86A of the IEEE 802.3ba specifications.

Parameter	Value	Units	Notes
Data rate per lane	10.3125	Gbps	As per 802.3ba: 100GBASE-SR10 and nPPI specifications
Number of operational lanes	12		100GbE operation utilizes the middle ten lanes (Rx and Tx) of the 12 physically defined lanes
Link Length	100 150	m m	OM3, 2000 MHz·km OM4, 4700 MHz·km
Operating Temperature Range	0-70	°C	Case Temperature
Power Supply Voltage	3.3 and 2.5	V	
Management Interface	Two-Wire Serial		Compatible with industry standard two-wire serial protocol scaled for 1.2 volt LVCMOS. It can also tolerate 3.3V LVTTL.
Laser Output Power	Class 3R (Class 1M at Fiber Output)		Without optical connector.
Electrical Interface	MEG-Array		1.27mm pitch and 4mm contact mate height
Module Dimensions	18.6 x 22 x 14.5 18.6 x 22 x 15.6	mm mm	Flat Ribbon Cable Housing Round Ribbon Cable Housing

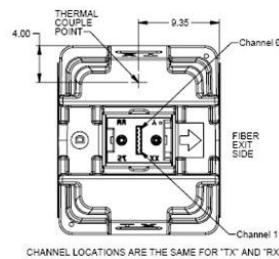
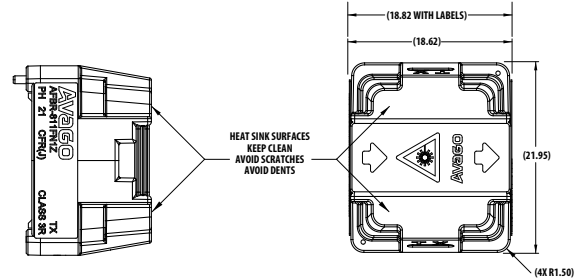
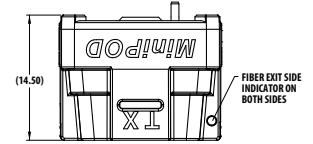
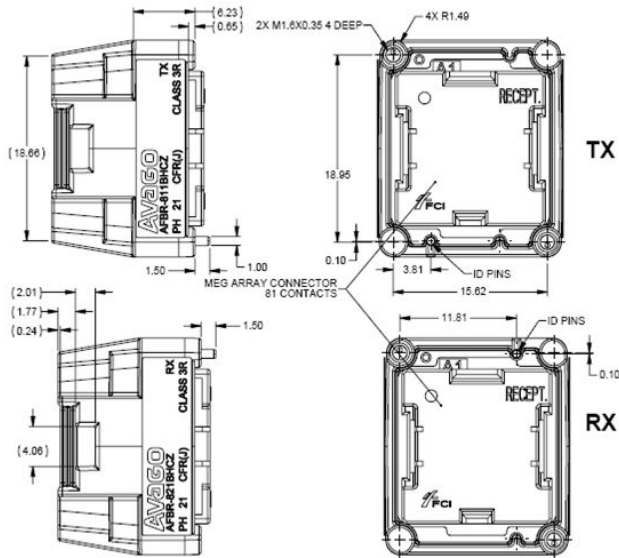


#### Laser Safety Notice

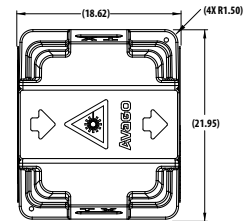
\* A Class 3R laser is considered safe if handled carefully, with restricted beam viewing. With a class 3R laser the maximum permissible exposure can be exceeded, but with a low risk of injury.

# Mechanical Dimensions, Package Outlines

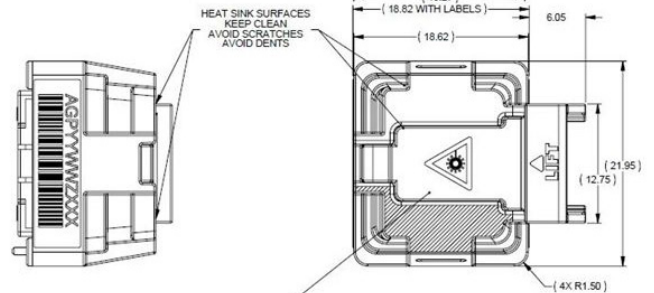
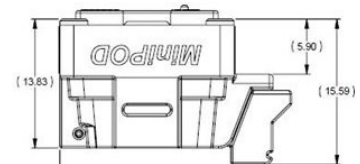
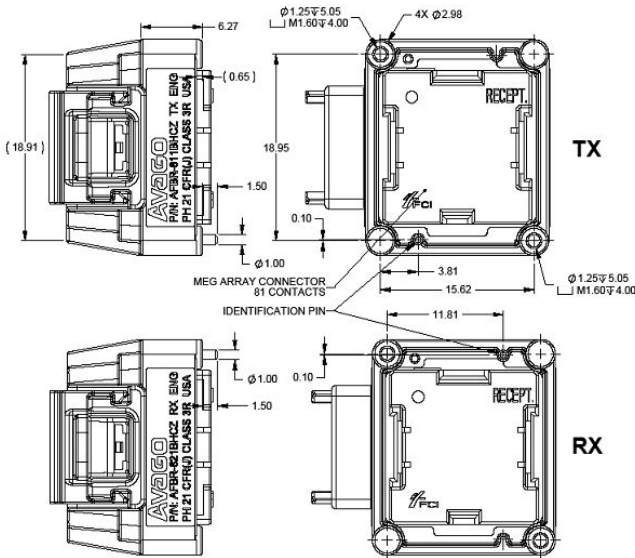
## Flat Ribbon Cable Housing



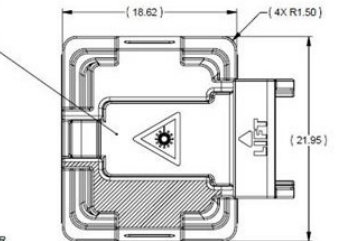
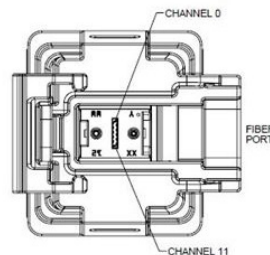
CHANNEL LOCATIONS ARE THE SAME FOR 'TX' AND 'RX'



## Round Cable Housing



COVER COLOUR CODE  
TX: WHITE  
RX: BLACK



\* All dimensions in millimeters: Mechanical dimensions depicted are nominal dimensions and are subject to change

For product information and a complete list of distributors, please go to our web site: [www.avagotech.com](http://www.avagotech.com)

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