



## RF OVER FIBER OPTIC LINK

### OZ510 – Pluggable 3GHz Tx/Rx



### Features

- 30 MHz to 3.0 GHz Bandwidth
- Small Size: 1.5 x 2.5 x 0.6 in.
- -20°C to +75°C Operating Temperature Range
- LD/PD Monitoring & Alarm
- High SFDR
- Automatic Optical Power Control
- 1.3/1.5  $\mu\text{m}$  Isolated DFB Lasers
- Laser conforms to Class 1 Laser Safety, EN60825-1:2007.

### Options

- CWDM Grade Lasers
- Extended Bandwidth of 10 KHz to 3.5 GHz
- Extended Temperature from -40°C to +75°C
- Built-in Low Noise Amplifier in the Tx Module
- Multimode Fiber Compatibility
- Low Power Dissipation

### Applications

- L-Band
- 4G LTE Cellular Backhaul
- Avionics
- MMDS
- Remote Antenna Location
- Satcom
- In-Building DAS Solutions
- GPS Distribution
- Timing Delay
- 10MHz low phase noise Clock distributions (Optional)

# OZ510

## Description

The OZ510 Series consists of compact individual Tx and Rx modules, with high performance designed for RF over Fiber Optics (RToF) applications. These modules are designed to be Pluggable, using optional miniature 50 ohms SMB connectors for quick implementations and conversion of any RF signal, on board, to optical signal, in any wavelength including CWDM grade. The OZ510 modules comes with a built in RF shield to support low EMI/RF interference for Single Mode Fiber or optional Multimode Fiber applications. These highly linear RToF Links offer an excellent alternative to legacy coaxial cable systems. The OZ510 delivers significant improvements in the transport of RF signals in their native format, reliably, over many types of optical networks, and across a broad range of frequencies. The low NF and high IP3 performance are a perfect solution for high Spurious Free Dynamic Range (SFDR) applications within broad range of operational frequencies. Optional extended bandwidth of 10 KHz to 3.5 GHz is also available.

The standard optical connector is SC/APC (FC/APC is also available) for low back reflection applications. The Receiver features a high performance InGaAs photodiode and the Transmitter is based upon a linear optically Isolated DFB Laser operating at either 1.3 or 1.5  $\mu\text{m}$  over 9/125  $\mu\text{m}$  Single Mode Fiber. Average Automatic Power Control (AAPC) is incorporated for optimal optical power stability over the full temperature range. The RF interface is via a 50 Ohms SMA or SMB (Plug or Jack) connector. Alarm and monitoring functions are available through a 10-pin connector.

## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units
Storage Temperature (Case)	$T_s$	-40	+85	°C
Operating Temperature (Case) 1310nm (-20C for 1550nm lasers)	$T_o$	-40	+75	°C
DC Supply Voltage	$V_{cc}$	11.5	12.5	Volts
Maximum RF Input into TX (with LNA)			+5	dBm
Maximum RF Input into TX (No LNA)			+17	dBm
Maximum Optical Input into Rx			12	mW

## Characteristics of OZ510

Parameter	Symbol	Min	Typical	Max	Units	Notes
Power Supply Voltage	VCC		12		Volts	
Power Supply Current TX	ICCTx		60	80	mA	1
Power Supply Current TX (with LNA)	ICCTx		140	160	mA	1
Power Supply Current RX	ICCRx		155	180	mA	1
Laser Optical Output Power TX			2.5	6	mW	
Laser Optical Output Power TX (with LNA)			2	6	mW	
Transmitter Operating Wavelength A/B	$\lambda$	1270	1310 or 1550	1610	nm	
Receiver Operating Wavelength B/A	$\lambda$	1270		1610	nm	
High Frequency Cutoff	HFC		3000	3100	MHz	2
Low Frequency Cutoff	LFC	20	30		MHz	3
Frequency Response (28 - 3000 MHz)			+/- 1.5	+/- 1.75	dB	
Input/Output Impedance	Z		50		Ohms	
Input/Output VSWR (28 - 3000 MHz)			1.5:1	1.8:1		
Input/Output VSWR (28 - 3000 MHz) (with LNA)			1.6:1	1.8:1		
Spur Free Dynamic Range	SFDR		110		(dB/Hz) <sup>2</sup> / <sub>3</sub>	4
Spur Free Dynamic Range (with LNA)	SFDR		109		(dB/Hz) <sup>2</sup> / <sub>3</sub>	4
RF Link Gain		-1	+1	+3	dB	4
RF Link Gain (with LNA)		19	20	22	dB	4
Input Noise Floor Density @ 1 GHz	EIN		-134	-130	dBm-Hz	4
Input Noise Density @ 1 GHz (with LNA)	EIN		-154	-150	dBm-Hz	4
Input Third Order Intercept @ 1 GHz	IIP3	29	31		dBm	4
Input Third Order Intercept @ 1 GHz (with LNA)	IIP3	8	10		dBm	4
Group Delay TX/RX Link (electronics only)	GD		0.5	1	nS	

<sup>1</sup> Total Power Consumption per Tx and Rx module.

<sup>2</sup> For higher HFC contact Factory.

<sup>3</sup> For lower LFC contact Factory.

<sup>4</sup> Measured with 1 meter of Single Mode Optical Fiber.

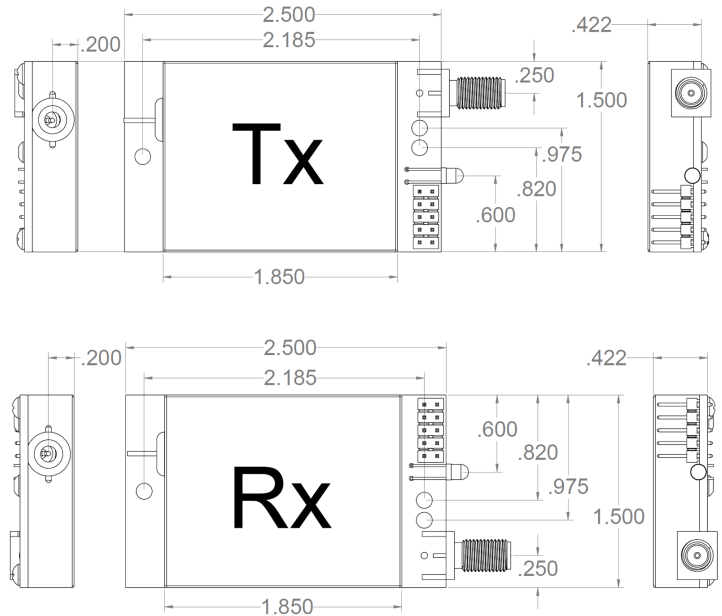
<sup>5</sup> Other variations of Gain, NF and IIP3 are available upon request. Contact Factory for more details.

All measurements are taken at @ 25°C

### PIN Assignments

Pin	Tx	Rx	Pin	Tx	Rx
1	Laser Enable (+12V)	NC	2	NC	NC
3	Ground	Ground	4	NC	NC
5	+12 Volts	+12 Volts	6	NC	NC
7	Tx Monitor (0.1V/1mA)	Rx Monitor (0.1V/1mW)	8	NC	NC
9	Tx Alarm Open Collector	Rx Alarm Open Collector	10	NC	NC

RF Connectors = SMB PCB mount plug/jack or SMA Plug Horizontal  
 Optical Connectors = SC / APC (Optional FC / APC or LC / APC)  
 Supply + Monitor + Alarm = 10 Pin Connector

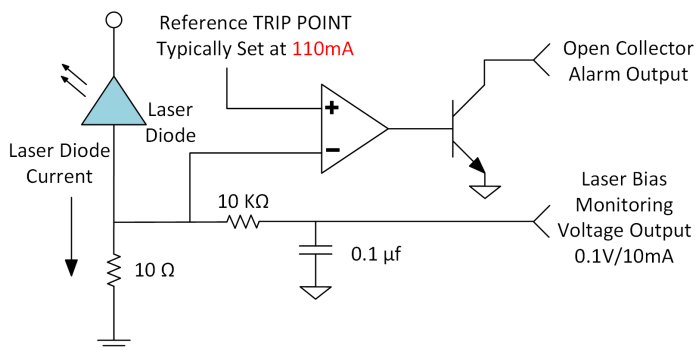


### ALARM

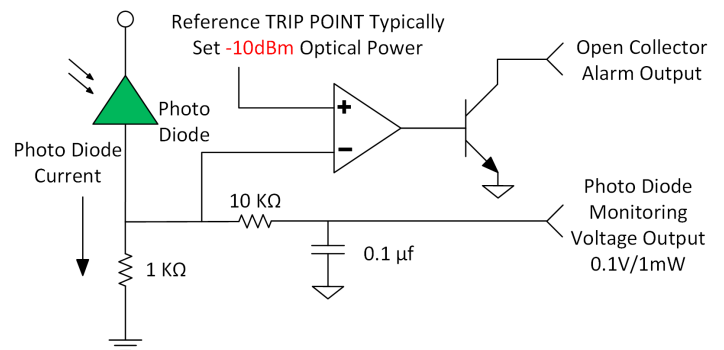
Transmitter Dual Color LED Laser Bias Indicator. Receiver Dual Color LED Received Optical Power Indicator.

LED Indications	GREEN	RED
Transmitter	Laser Bias Current Normal < 110	Laser Bias Current Fault
Receiver	Input Optical Power Normal > -10	Input Optical Power Fault

### Individual Tx Alarm & Monitoring Circuit Diagram



### Individual Rx Alarm & Monitoring Circuit Diagram



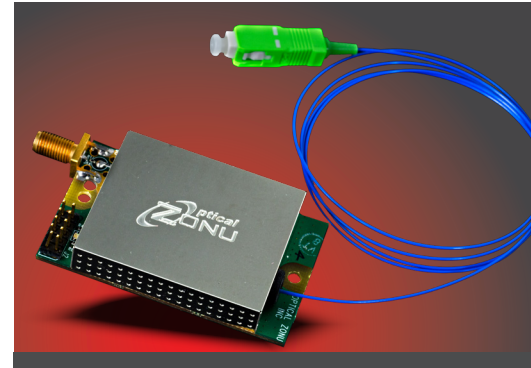
All alarms are Open Collector topology, with Active Low for Normal operations and during Alarm condition the open collector will Pull to High logic levels. Reverse polarity alarm is also available upon request, such as under normal conditions the Open collector will be High and vice versa under fault conditions.

## Ordering Information

PART NO.

# AX3- Z510 – XXX – XX – XX

<b>0</b> – Unidirectional Link with Tx & Rx	<b>D31</b> – 1310 nm	<b>A</b> – SMA	<b>S</b> – SC / APC	<b>S</b> – Single Mode Fiber Compatible	<b>L</b> – Built-in LNA on Tx
<b>1</b> – Transmitter Only (Tx)	<b>D55</b> – 1550 nm	<b>B</b> – SMB	<b>F</b> – FC / APC	<b>M</b> – Multimode Fiber Compatible	– No LNA
<b>2</b> – Receiver Only (Rx)	<b>00</b> – for Rx only				



## Contacts

### HEADQUARTERS

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