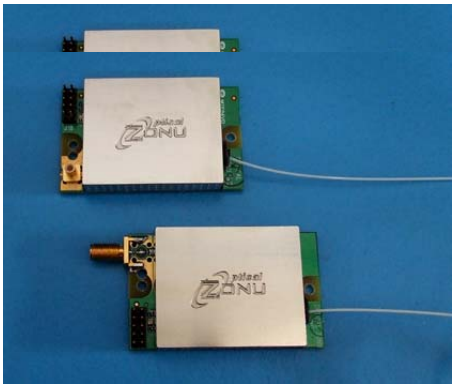
RF over Fiber Optic Link

OZ510 Series



FEATURES

- 30 MHz to 3.0 GHz Bandwidth
- Approx 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 µm Isolated DFB Lasers
- Laser Conforms to Class 1 Emission Level per CDRH and IEC-825 (EN 60825) Standards

OPTIONS

- CWDM Grade
- Extended Bandwidth of 1 MHz to 3.3 GHz
- Extended Temperature from -20°C to +75°C
- Built-in Low Noise Amplifier in the Tx Module
- Multimode Fiber Compatibility

APPLICATIONS

- Wi-Max
- 4G LTE
- Cellular Backhaul
- Avionics
- MMDS
- Remote Antenna Location
- Satcom
- In-Building DAS Solutions
- GPS Distribution
- Timing Delay

DESCRIPTION

The OZ510 Series consists of compact individual Tx and Rx modules, with high performance designed for RF over Fiber Optics (RFoF) 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 wavelengths including CWDM grade. They are designed to be compact with built in RF shield to support low EMI/RF interference for Single Mode Fiber or optional Multimode Fiber applications.

These linear RFoF 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 is a perfect solution for high Spurious Free Dynamic Range (SFDR) applications within broad range of operational frequencies. Optional extended bandwidth of 1 MHz to 3.3 GHz is also available.

The standard optical connector is SC/APC (FC/APC 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 µm (A) over 9/125 µm 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)	T_O	-20	+75	°C
DC Supply Voltage	V_{PD}	11.5	12.5	V
Maximum RF input into Tx (no LNA)			+15	dBm
Maximum Optical Input into Rx			4	mW

CHARACTERISTICS OF OZ510

Parameter	Symbol	Min	Typical	Max	Units	Notes
Power Supply Voltage	VCC		12		V	
Power Supply Current TX	ICCtx		60	80	mA	1
Power Supply Current RX	ICCrx		155	175	mA	1
Laser Optical Output Power			2		mW	
Transmitter Operating Wavelength A/B	λ	1310	1550	1610	nm	
Receiver Operating Wavelength B/A	λ	1310	1550	1610	nm	
High Frequency Cutoff	HFC		3000	3300	MHz	2
Low Frequency Cutoff	LFC	.01	30		MHz	3
Frequency Response (28 – 3000 MHz)			+/- 1.5		dB	
Input/Output Impedance	Z		50		Ohm	
Input/Output VSWR (28-3000 MHz)			1.5:1	1;8:1		
Spur Free Dynamic Range	SFDR		110		$(dB/Hz)^{2/3}$	4
RF Link Gain		-1	2	+1	dB	4
Input Noise Floor @1GHz	EIN		-134	-130	dBm-Hz	4
Input Third Order Intercept @ 1GHz	IIP3	27	31		dBm	4

1. Does not include custom Gain, NF and IIP3 configurations. Contact Factory for more details.
2. Typical High Frequency Cutoff (HFC) is 3000 MHz. For higher HFC contact Factory.
3. Typical Low Frequency Cutoff (LFC) is 30 MHz. For lower LFC contact Factory.
4. Measured with 1 meter of Single Mode Optical Fiber.
5. Other variations of Gain, NF and IIP3 are available upon request. Contact Factory for more details. All measurement taken at @ 25°C.

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CHARACTERISTICS OF OZ510 Link with LNA (in the Tx)

Parameter	Symbol	Min	Typical	Max	Units	Notes
Power Supply Voltage	VCC		12		V	
Power Supply Current TX	ICCtx		140	160	mA	1
Power Supply Current RX	ICCrx		155	175	mA	1
Laser Optical Output Power			2		mW	
Transmitter Operating Wavelength A/B	λ	1310	1550	1610	nm	
Receiver Operating Wavelength B/A	λ	1310	1550	1610	nm	
High Frequency Cutoff	HFC		3000	3300	MHz	2
Low Frequency Cutoff	LFC	1	30		MHz	3
Frequency Response (28 – 3000 MHz)			+/- 1.5		dB	
Input/Output Impedance	Z		50		Ohm	
Input/Output VSWR (28-3000 MHz)			1.6:1	1:8:1		
Spur Free Dynamic Range	SFDR		110		$(dB/Hz)^{2/3}$	4
RF Link Gain		19	20	21	dB	4
Input Noise Floor @1GHz	EIN		-153	-150	dBm-Hz	4
Input Third Order Intercept @ 1GHz	IIP3		12		dBm	4

1. Total Power Consumption for both Tx and Rx.
2. Typical High Frequency Cutoff (HFC) is 3000 MHz. For higher HFC contact Factory.
3. Typical Low Frequency Cutoff (LFC) is 30 MHz. For lower LFC contact Factory.
4. Measured with 1 meter of Single Mode Optical Fiber.
5. Other variations of Gain, NF and IIP3 are available upon request. Contact Factory for more details
   All measurements are taken at @ 25°C

10 PIN CONNECTOR CONFIGURATIONS

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	Rx Monitor	**8**	NC	NC
9	Tx Alarm Open Collector	Rx Alarm Open Collector	**10**	NC	NC

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

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.

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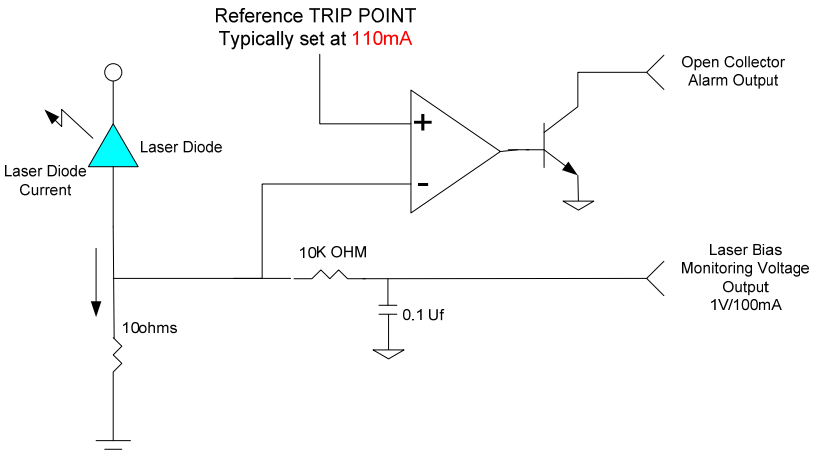
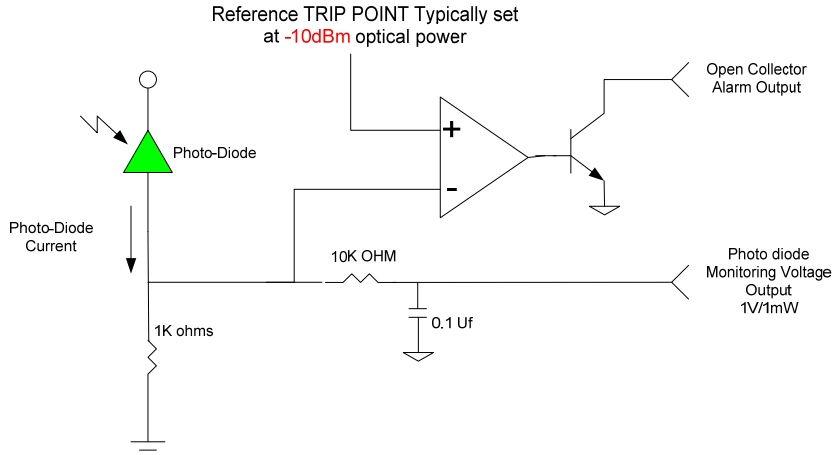
INDIVIDUAL Tx ALARM & MONITORING CIRCUIT DIAGRAM



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.

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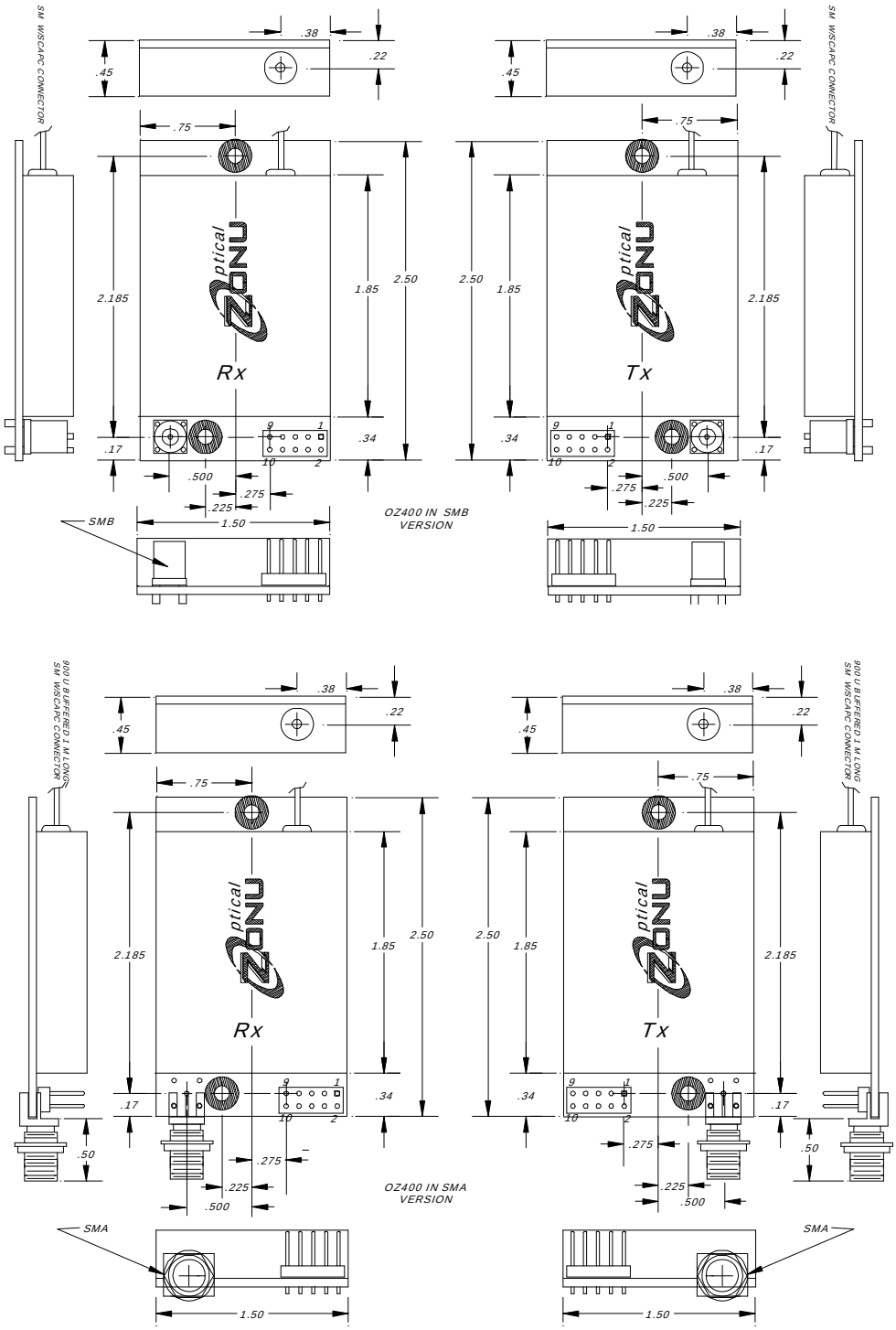
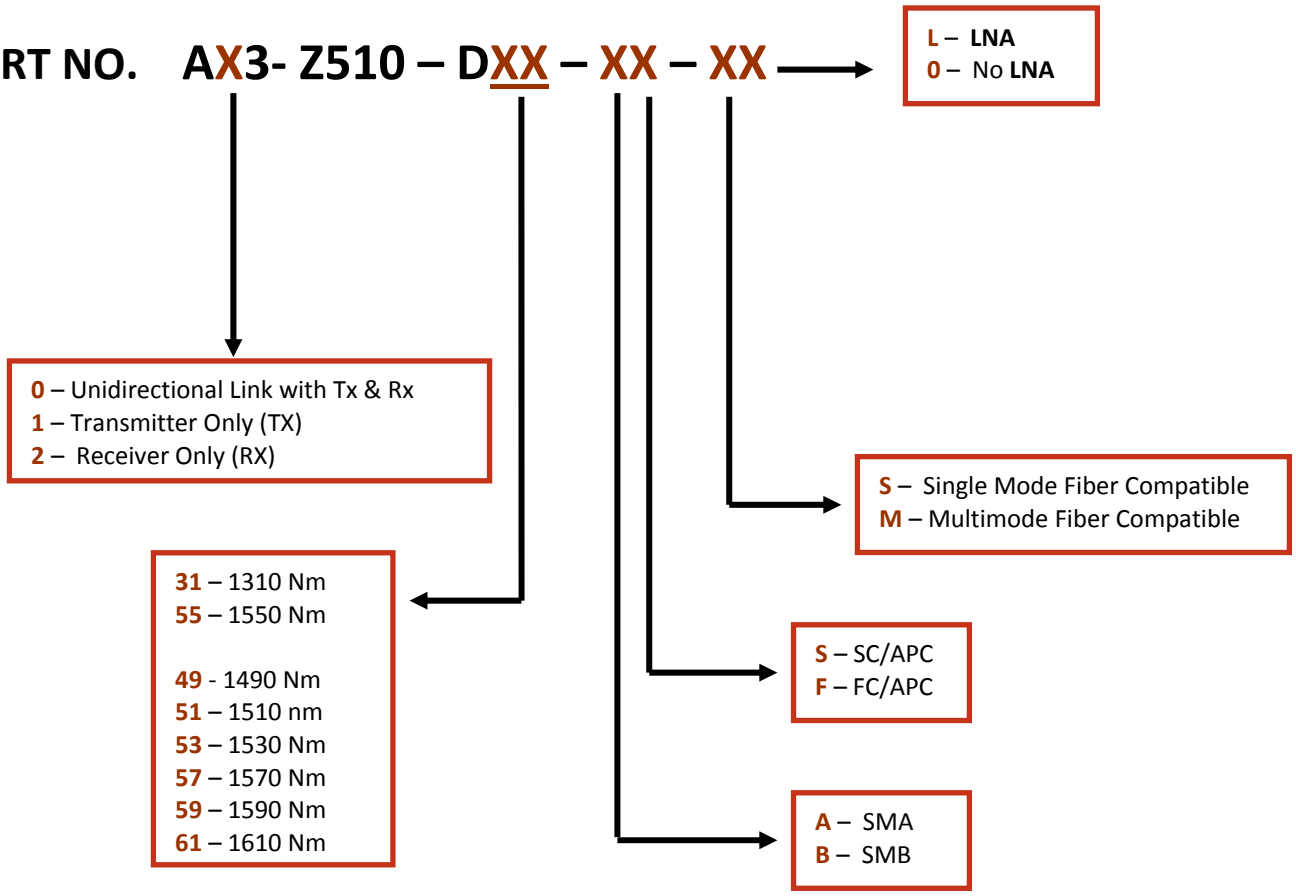
MECHANICAL DRAWING



ORDERING INFORMATION

PART NO. AX3- Z510 – DXX – XX – XX



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