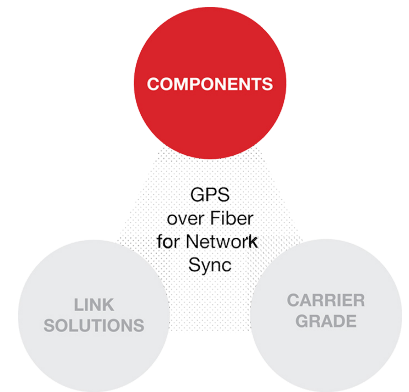




## RF OVER FIBER

OZ600RP – Standalone 3GHz Repeater



### Features

- 30 MHz to 2.7 GHz Bandwidth
- Rugged Dust-Tight Housing
- 3 x 5 x 1.25 in. Weight ¾ lb
- -40C to +75C Operating Temperature
- Wide DC Input Range of +9V to +30V Supply
- LD/PD Monitoring and Alarm
- High Spurious Free Dynamic Range
- Automatic Optical Power Control
- 1.3/1.5  $\mu$ m Low Noise DFB Lasers with isolator
- Laser conforms to Class 1 Laser Safety, EN60825-1:2007.
- Internal Transmitter LNA

### Options

- Extended Bandwidth of 10 KHz to 3.3 GHz
- CWDM DFB Laser
- Manual Gain Adjust 30dB
- Multimode Fiber Compatibility
- Low Power Dissipation
- Bias-T, +5V or 12V Max 100mA
- Antenna Load Propagation

### Applications

- L band Satcom
- Cellular Backhaul
- MMDS
- 10MHz Low Phase Noise Clock Distributions (Optional)
- Remote Antenna Location
- In-Building DAS Solutions
- GPS Distribution
- Optical Delay Line
- Public Safety

# OZ600RP

## Description

The OZ600RP is a Broadband Optical Repeater with a wide Dynamic Range designed for RF over Fiber applications, including GPS over Fiber, Radio distribution in tunnels or mines, etc. Each unit consists of a receiver, RF power splitter and a transmitter that propagates the signal to the next "station". The patented Antenna Status propagation enables active load switching at the RF output. The internal LNA keeps the overall Noise Figure low and compatible with the application. These linear RfOf links are an excellent alternative to using a coaxial cable link. Packaged in a rugged dust-tight Cast Metal housing the OZ600RP offers a high Spurious Free Dynamic Range (SFDR) from 30 MHz to 2.7 GHz. Optional extended bandwidth of 10 KHz to 3.3 GHz is also available. The Manual Gain Control feature offers a simple way to adjust the receiver output RF level. The standard optical connector is SC/APC (FC/APC available) and the RF interface is a 50 Ohms SMA connector. Alarm and monitoring functions are available through DB9 connectors and local dual color LED's for Received Optical Power and Laser Bias Current Monitoring.

**Patent Number US 10,257,739 B1**

## Absolute Maximum Ratings

| Parameter  | Symbol          | Min | Max | Units |
|--|-----------------|-----|-----|-------|
| Storage Temperature (Case)   | T <sub>s</sub>  | -40 | +85 | °C    |
| Operating Temperature (Case) 1310nm DFB Laser, -20C for 1550nm Laser1550nm Laser | T <sub>o</sub>  | -40 | +75 | °C    |
| DC Supply Voltage  | V <sub>cc</sub> | +8  | +32 | Volts |
| Maximum RF Input into TX (no LNA)  |                 |     | +17 | dBm   |
| Maximum Optical Input into Rx  |                 |     | 12  | mW    |

### Characteristics of OZ600RP

| Parameter                              | Symbol | Min   | Typical      | Max  | Units                  | Notes     |
|--|--------|-------|--------------|------|------------------------|-----------|
| Power Supply Voltage                   | VCC    |       | 12           |      | Volts                  |           |
| Power Supply Current                   | ICC    |       | 320          | 380  | mA                     | *         |
| Laser Bias Monitor                     | LBM    |       | 1            |      | V/100mA                |           |
| Laser Bias Open Collector Trip Point   | LBA    |       | 110          |      | mA                     | (or 1.1V) |
| Optical Rx Monitoring                  | ORM    |       | 0.1          |      | V/1.mw                 |           |
| Optical Rx Alarm                       | ORA    |       | -10          |      | dBm                    |           |
| Laser Optical Output Power             |        |       | 2            | 6    | mW                     | 5         |
| Transmitter Operating Wavelength A/B   |        | 1270  | 1310 or 1550 | 1610 | nm                     |           |
| Receiver Operating Wavelength B/A      |        | 1270  |              | 1610 | nm                     |           |
| High Frequency Cutoff                  | HFC    |       | 2700         | 3000 | MHz                    | 1         |
| Low Frequency Cutoff                   | LFC    | 20    | 30           |      | MHz                    | 2         |
| Frequency Response (30 to 2700 MHz)    |        |       | ±1.5         | ±2.0 | dB                     |           |
| Input/Output Impedance                 | Z      |       | 50           |      | Ohms                   |           |
| Input/Output VSWR (30 to 2700 MHz)     |        | 1.5:1 | 2:01         |      |                        |           |
| Spur Free Dynamic Range                | SFDR   |       | 109          |      | (dB/Hz) <sup>2/3</sup> | 3         |
| RF Link Gain                           |        |       |              |      |                        |           |
| Gain (Tx Unity Gain Link)              |        | -2    | 0            | +2   |                        |           |
| Gain (Tx 20)                           |        | 18    | 20           | 22   |                        |           |
| Input Noise Floor @ 1Gh                |        | -149  | -153         |      |                        |           |
| Input Third Order Intercept @ 1Ghz     |        | +8    | +10          |      |                        |           |
| Isolation                              |        | 40    | 50           |      |                        |           |
| Group Delay Over 4MHz (30 to 2700 MHz) |        |       | 0.5          | 1    | ns                     |           |

<sup>1</sup> Typical High Frequency Cutoff (HFC) is 2700 MHz. For higher HFC contact Factory.

<sup>2</sup> Typical Low Frequency Cutoff (LFC) is 30 MHz. For lower LFC contact Factory.

<sup>3</sup> Measured with 1 meter of Single Mode Fiber.

<sup>4</sup> Equivalent to IMD 60dB@0 dBm Total Output Power (2 tone measurement).

<sup>5</sup> 1310nm max optical power can reach 6mW under factory operational setting @25C

<sup>6</sup> The Bias-T option of +5V or +12V is to provide power to any active antenna may it be for GPS applications or any other applications with similar needs, where the amplifier is built inside the antenna providing better link sensitivity. The OZ600RP Transmitter monitors the Antenna and reports optically to the OZC GPS optical receiver.

GPS optical receiver has a built in active antennae load which switches to high impedance if there is a fiber fault or remote antennae failure working in conjunction with OZ600RP GPS transmitter.

\*For lower power dissipation version contact Factory.



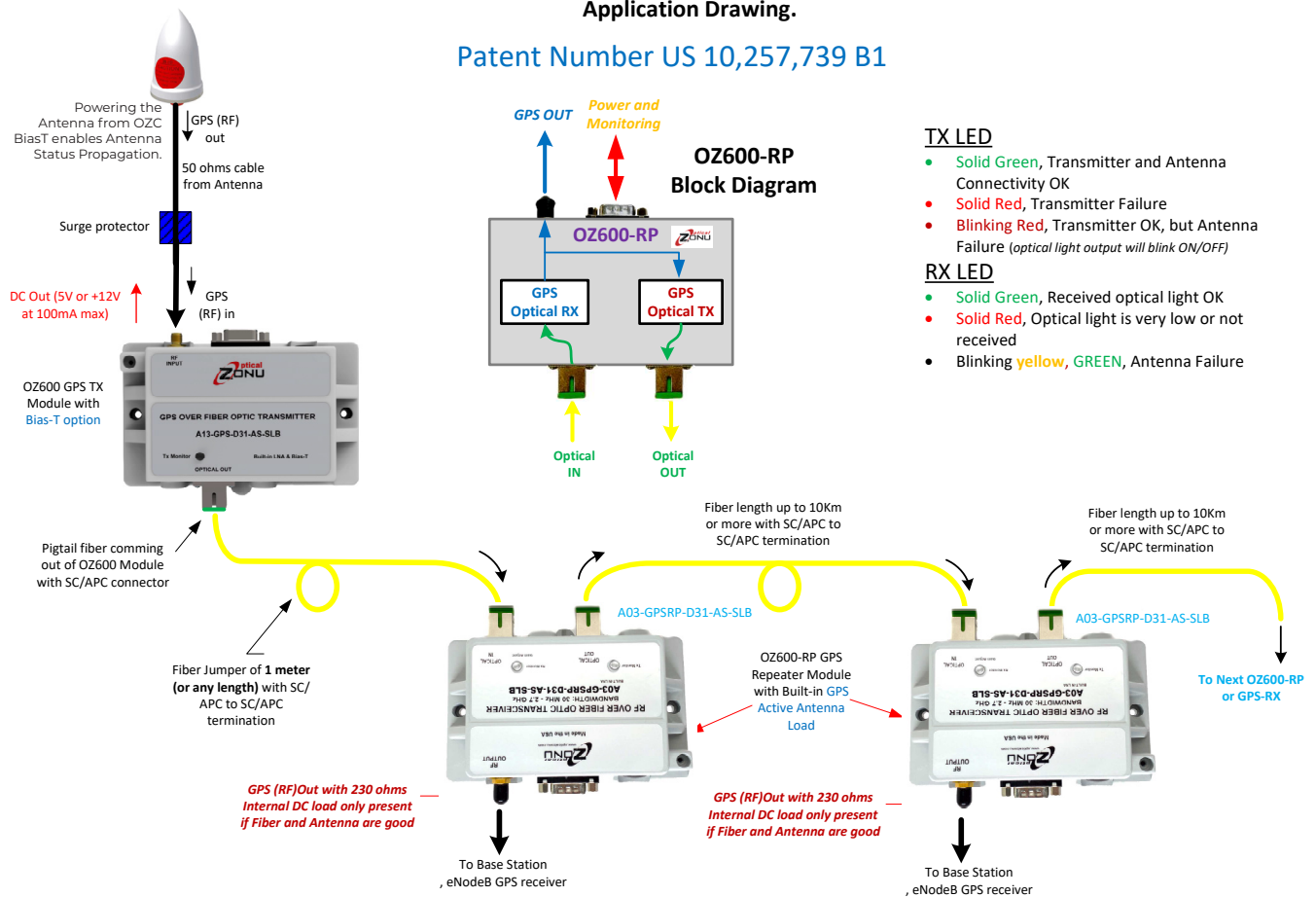
### GPS over Fiber application Drawing (OZ600-RP)

#### Daisy Chain, Multi-Drops Fiber Optics GPS Repeater Links

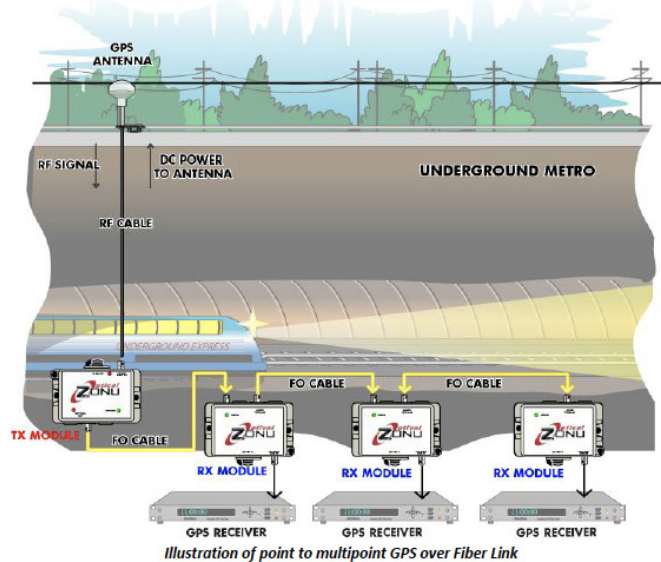
#### With GPS TX Bias-T, Antenna Monitoring and GPS RX output active DC Load

#### Application Drawing.

Patent Number US 10,257,739 B1



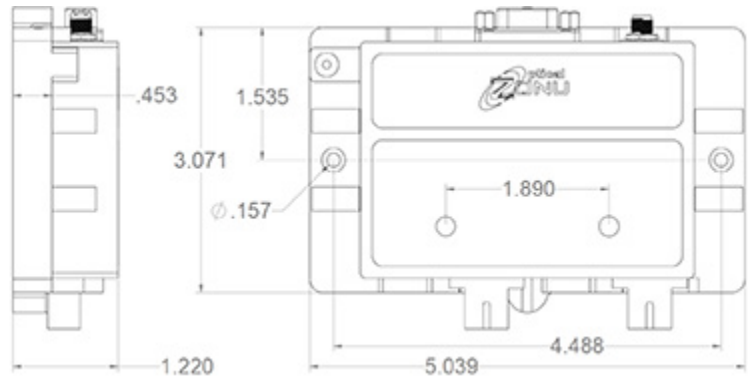
## Tunnel Radio Distribution



For other applications, e.g. Radio in tunnels, silos, etc. contact the factory.

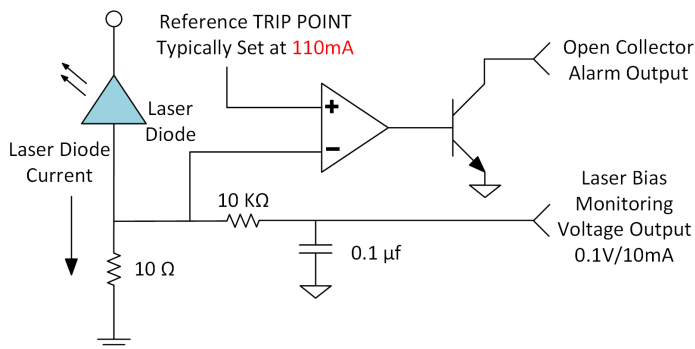
### DB-9 Configuration

| Pin | Function                                     |
|-----|--|
| 1   | Laser Enable (+12V = Laser ON)               |
| 2   | Data INPUT (Tx RS232) / OR NC                |
| 3   | Data OUTPUT (Rx RS232) / OR NC               |
| 4   | +12 volts (380 mA max)                       |
| 5   | Ground                                       |
| 6   | Laser Bias Monitor (0.1 V = 10 mA)           |
| 7   | Laser Bias Alarm (open collector, 25 mA)     |
| 8   | Received Power Monitor (0.1V = 1mW)          |
| 9   | Received Power Alarm (open collector, 25 mA) |

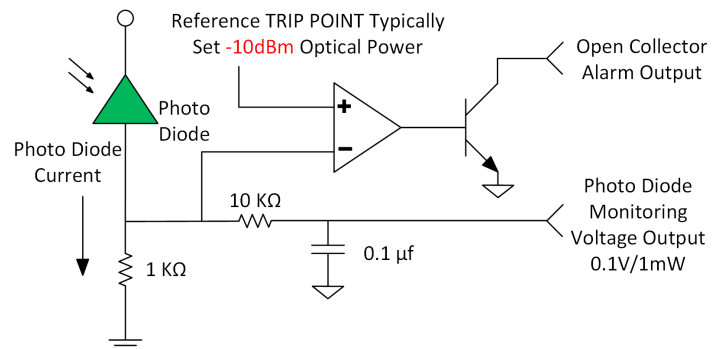


RF Connector = SMA Female  
Optical Connector = SC/APC or FC/APC  
DATA + ALARM = DB9

### 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 conditions 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.

## A03- Z600RP – DXX – AX – XX



|                            |                     |   |                               |
|----------------------------|---------------------|---|-------------------------------|
| <b>31</b> – 1310 nm        | <b>S</b> – SC / APC | <b>S</b> – Single Mode Fiber Compatible | <b>L</b> – Built-in LNA on Tx |
| <b>55</b> – 1550 nm        | <b>F</b> – FC / APC | <b>M</b> – Multimode Fiber Compatible   | – No LNA                      |
| CWDM Wavelengths available |                     |   |                               |

PART NO.

## A03- GPSRP – DXX – AX – XLB

|                            |                     |   |  |
|----------------------------|---------------------|---|--|
| <b>31</b> – 1310 nm        | <b>S</b> – SC / APC | <b>S</b> – Single Mode Fiber Compatible | <b>B</b> is for the Antenna Load Propagation |
| <b>55</b> – 1550 nm        | <b>F</b> – FC / APC | <b>M</b> – Multimode Fiber Compatible   |  |
| CWDM Wavelengths available |                     |   |  |

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