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# MetroNode OTMN-III

## 4-OUTPUT COMPACT, MODULAR, SCALEABLE FIBER DEEP FTTC OPTICAL NODE

### Features and Benefits

- Next Generation of the OT *"Metro Node"* family. Field-Proven design for the future.
- High Performance, High Output, Economical, Low Power Dissipation, Two-Way Capable
- Advanced GaAs device technology provides Excellent RF Performance to 1 GHz
- Quad RF Amplifier Module provides Four (4) +48 dBmV high level RF Output Ports
- Interstage Slope and RF Input/Output controlled via internal Plug-in EQs and Plug-in attenuator Pads
- Choice of frequency Diplexer splits: 42/54 MHz -or- 65/85 MHz for NTSC, PAL & CENELEC use
- +48 dBmV High RF Output Levels maintained over Wide Optical Input Range: -4 dBm to +3 dBm
- Multiple Redundancy & Segmentation Configurations via dual Receiver &/or dual Transmitter Options
- Choice of DFB & CWDM Return Lasers; High Performance Return Path: >15dB over 41dB NPR
- Power Factor Corrected Switching Power Supply accepts 40-90$V_{AC}$; Overvoltage Protection to 140$V_{AC}$
- Optional High Sensitivity Receiver (-8 dBm to -3 dBm)
- Optional Powering via 5$^{th}$ Dedicated AC Input Port; No Power Inserter Required at the Node
- Integrated User-Friendly Fiber Management Tray to accommodate optical fiber and splices

The **OLSON TECHNOLOGY, INC**. ***MetroNode*** **Model OTMN-III** is a high performance, four output CATV optical node, offering the capability of greater than +48 dBmV output levels. This node benefits the system operator by extending overall path length, maximizing equipment usage, and reducing the number of network elements. Full RF output can be maintained with an optical input as low as -4 dBm. With system performance to 1 GHz, the new ***Metronode*** **OTMN-III** provides the ideal platform for support of the evolving technologies and services in today's advanced HFC and PON networks. ***Metronode*** **OTMN-III** offers protection configurations which are ideal for critcal analog and digital television, telephony, and data services. Utilizing extensive modular design with easy in-field replacement, the ***Metronode*** **OTMN-III** can meet any advanced broadband network requirement.

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***MetroNode*** **OTMN-III** is an appropriate final active component in any broadband CATV system. Configured in a rugged, weatherproof, minimal footprint, finned cast-aluminum housing, the unit is ideal for strand or pedestal mounting. The node operates over a wide temperature range and accepts cable powering from 40 to 90 $V_{AC}$ with over-voltage protection to 140 $V_{AC}$. Cable and fiber entry ports accept standard 5/8-24 threaded CATV connectors. Internal RF connections are made with75-ohm mini SMB connectors. RF test connections are male type-G and mate with standard adapters. The unit also has user and fiber friendly fiber-organizing tray with large spools for management of input/output optical fibers and optical splices.

Redundant optical forward receiver and return transmitter capability in the ***Metro Node*** **OTMN-III** assures increased network reliability. Careful design of the receiver circuit allows for a variety of channel loading up to 1 GHz with all types of global analog and QAM digital RF signals. Each receiver utilizes a PIN optical receiver and low-noise preamplifier to assure optimum carrier-to-noise performance. Setup of the receiver is facilitated by an internal optical test point circuit. Level control and equalization of forward and return paths are made by the use of plug-in pads and equalizers. Forward and reverse -20 dB RF test points are provided. DC test points are provided for received optical power input level and return laser transmitter output power.

The optical input receivers have three configuration options to meet any type of operating requirements. Option 0 is a single RF input from a single optical receiver unit. The signal passes through the options board to the RF amplifier section. Option 1 provides for automatic switching of redundant RF signals from the output of two optical receivers. The plug-in option board includes all detection circuitry and the RF switch. The output of the RF switch passes to the RF amplifier section of the node. Option 2 is used for split band operations, where the received signals from the two optical receivers are two different portions of the RF spectrum. This option allows node combining of standard RF signals and QAM signals or VOD signals. Both signal paths include filtering for optimum combining, and minimizing out-of-band noise. The split frequency may be at any frequency from 100 MHz to 650 MHz. Option 3 is a single RF input from a special High Sensitivity (-3 dBm to -8 dBm) optical receiver unit.

The ***Metro Node*** **OTMN-III** uses GaAs amplifier technology producing four independent RF output ports, each capable of delivering +48 dBmV with excellent specifications into four bi-directional coaxial ports. Each port has a forward (downstream) passband of 54-1,000 MHz and a reverse (upstream) passband of 5-42 MHz. Optional return passband frequencies for 5-65 MHz and DOCSIS-3 applications are also available. All four bi-directional ports are capable of passing power into or out of the node. Separate jumper plugs configure each of the ports. These jumpers may also be replaced by automotive type ATC fuses. A fifth port designated as a power port can also be fused.

The amplifier section is fully-segmentable using multiple forward path optical receiver modules and dual return path transmitter modules in the lid. Plug-in jumpers in the RF pad sockets are used to configure the forward amplifier module for one RF input and four output ports (1x4), two RF inputs with two output ports (2x2), or four separate RF inputs to each of the four RF output ports (4x4). The return path can be segmented in the same configurations.

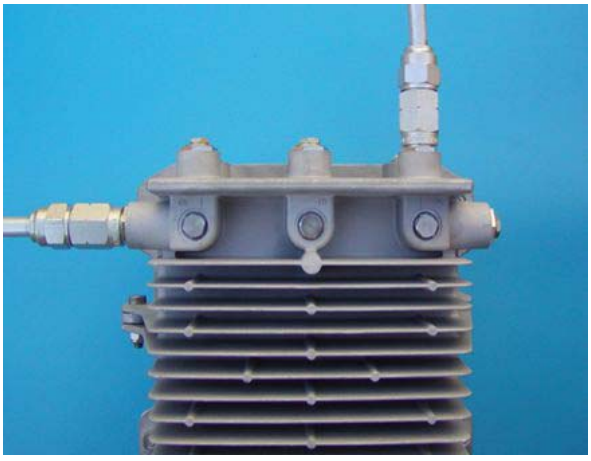
The housing lid can accept multiple receiver and transmitter modules in six slots. Two forward path receiver modules can be configured with an optional RF A/B switch for redundant ring operation. Two or four forward path optical receivers can operate for node segmentation. The return path dual transmitter modules are used for the similar operations with the upstream signals.

Two power supplies can also be installed in the lid for maximum reliability.

# MetroNode OTMN-III

## SPECIFICATIONS

| | |
|---|---|
| Optical Input Range (Standard) | -4 dBm to +3 dBm |
| Optical Input Range (Optional) | -8 dBm to -3 dBm |
| Forward Frequency Range | 54 MHz to 1,000 MHz or 85 MHz to 1,000 MHz |
| Reverse Frequency Range | 5 MHz to 42 MHz or 5 MHz to 65 MHz |
| Forward Frequency Response | <±0.75 dB to 1,000 MHz |
| Reverse Frequency Response | <±0.75 dB 5 MHz to 42 MHz or 5 MHz to 65 MHz |
| Output Level (Forward) | +48 dBmV @ 550 MHz (Each of four outputs)<br>With -1 dBm optical input, 10 dB slope to 1,000 MHz, and<br>Transmitter OMI @ 3.2%. |
| Distortion | >62 dB CSO/CTB @ above output and +3 dBm optical input.<br>Carrier loading (77 channels) to 550 MHz. Simulated data loading @ -6 dB<br>from 550 MHz to 1,000 MHz. |
| Carrier to Noise | >53 dB @ -1 dBm optical or greater<br>Carrier loading (77 channels) to 550 MHz |
| In/Out Return Loss | >16 dB - All ports |
| Return Laser Output Power(s) | 2.5 mW and 3.0 mW ±0.5 mW |
| Return Path NPR<br>(With DFB Return Laser) | Range over 41 dB NPR is >15 dB measured with 10 dB of fiber and with<br>Olson Technology Inc. LP-OR-300 return band receiver. |
| Return Path NPR<br>(With DFB Return Laser) | Range over 41 dB NPR is as follows:<br>>13 dB measured with 10 dB of fiber as above and both bands moving<br>together. |
| Return Path NPR Threshold | <-57 dBmV/Hz |
| Operating Temperature Range | -40°C to +65°C |
| Gain Variation vs. Temperature | <±1 dB typica<br><±1.5 dB Max } FORWARD<br><±1.8 dB REVERSE |
| AC Power Requirements | 76.5 Watts @ 60 $V_{AC}$ @ 50-60 Hz; (45$V_{AC}$ to 90$V_{AC}$). Will withstand<br>overvoltage to 140 $V_{AC}$ |
| Internal Test Points | See unit diagram for functional description and location |
| Hum Modulation | >60 dB @ 15 Amps AC current from any one port 7MHz to 25MHz<br>>65 dB @ 15 Amps AC current from any one port 25MHz to 1,000MHz |
| Size | 15.5"W x 10.3"D x 9.5"H |



# OTMN-III MODEL NUMBER CONFIGURATOR

| OTMN3 - | N - | XYZ - | AB - | CD - | EF - /OPT |
|---|---|---|---|---|---|
| **Diplexer Freq** | **Return Transmitter(s)** | **Receiver(s)** | **Port Segments** | **OPTIONS** |
| 0: *42/54 MHz*<br><br>*1: 65/85 MHz* | 000: *NO return transmitter*<br>X=0 Single Transmitter<br>X=1 Dual Transmitter module<br><br>X=3 Dual Transmitter module, 2x4 return paths<br>X=4 TWO Dual Transmitters, 4x4 return paths<br><br>Y=2 3 mW DFB NTSC 1310nm<br>Y=3 3 mW DFB PAL 1310nm<br>Y=4 2.5 mW DFB NTSC 1550nm<br>Y=5 2.5 mW DFB PAL 1550nm<br>Y=6 2.5 mW DFB NTSC CWDM<br>Y=7 2.5 mW DFB PAL CWDM<br>(Specify CWDM wavelengths, 1470 nm to 1610 nm)<br><br>Z=A Filter Bypass<br>Z=B 10 MHz High Pass Filter | 00: *Single Rx (std)*<br>01: *Two Rx w/ABS*<br>02: *Two Receivers*<br>03: *Four Receivers*<br>04: *High Sensitiviity Rx*<br>05: *Two Rx High Sensitivity w/ABS*<br>*06: Dual Split Band Rx (Contact Olson)* | 00: *1 input / 4 outputs*<br>02: *2 inputs / 4 outputs*<br>04: *4 inputs / 4 outputs* | /P: *Powder-coated housing*<br><br>*Other options as required (Contact Factory)* |

**Common part numbers:**

**OTMN3-0-000-00-00-00** One-way node, 54 MHz to 1 GHz with one input to four output ports.

**OTMN3-0-02A-00-00-00** Two-way node, 54 MHz to 1 GHz with one input to four output ports. Return paths 5 MHz to 42 MHz from all ports feed one 1310 nm DFB transmitter.

**OTMN3-0-32A-03-02-00** Two-way node, 54 MHz to 1 GHz with 2 inputs to dual output ports. Return paths 5 MHz to 42 MHz from 2 ports feed 1 of two 1310 nm DFB transmitters in a dual transmitter module.

## * ACCESSORIES REQUIRED FOR OPERATION

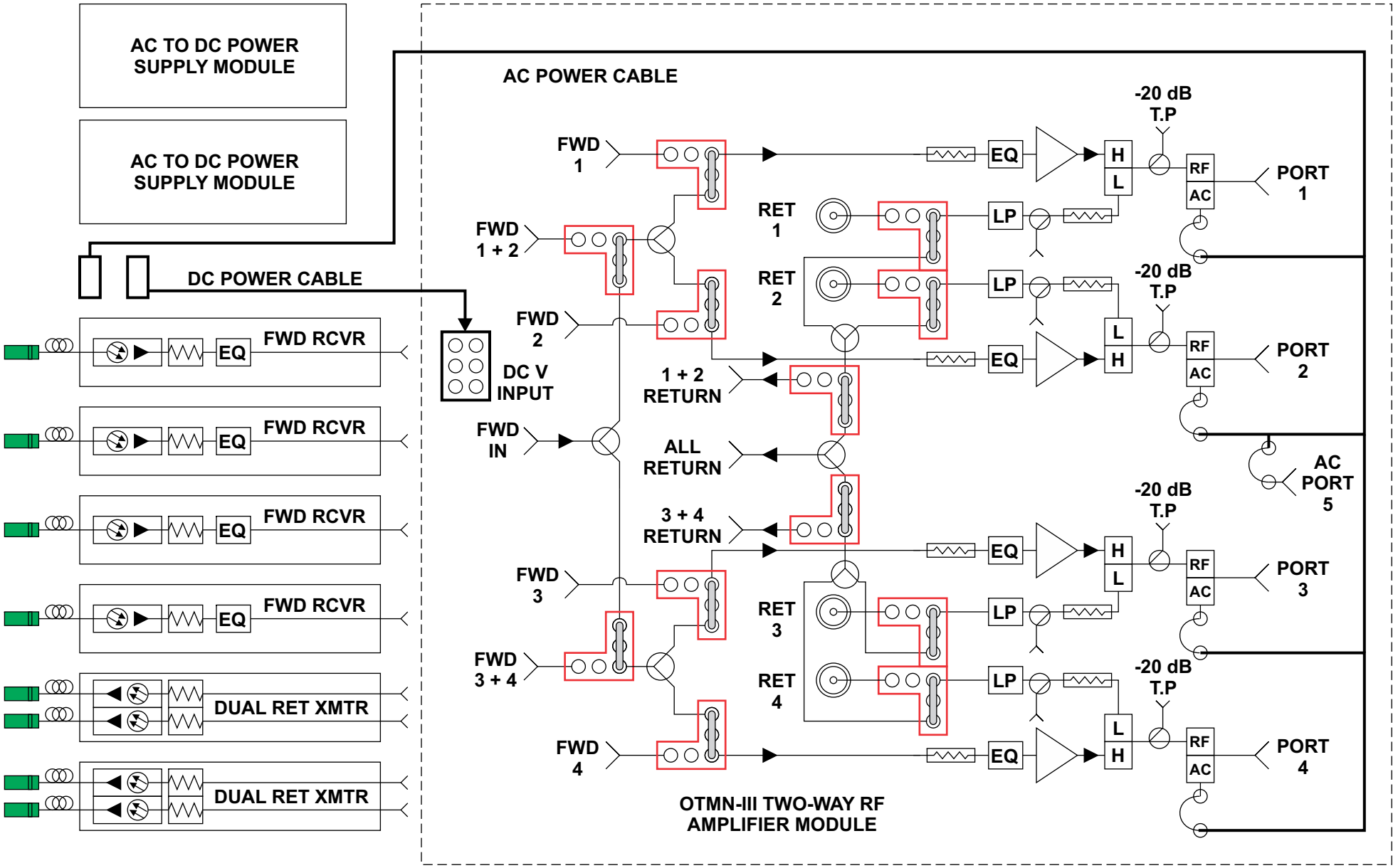
1) Plug-in RF Equalizers
   - Model 9510xxL *(Individual 1 GHz EQ; xx = value)*

2) Plug-in RF Attenuators
   - Model 9518xxL *(Individual attenuator pads; xx = value)*

3) Return path 4x4 adapter
   - Model xxxxxx (required for FOUR isolated return paths)

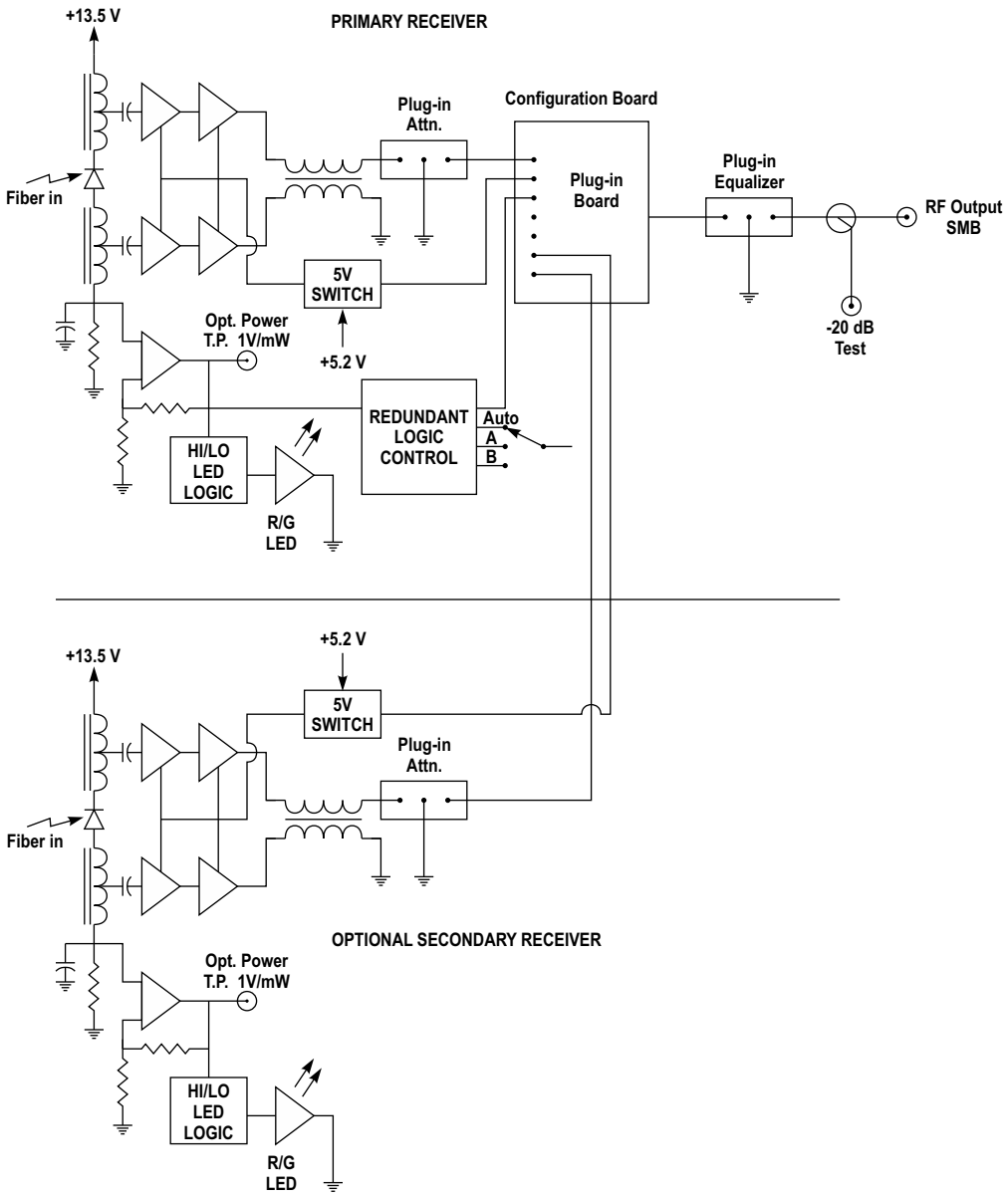
Standard OTMN-III node shipped with forward path RF performance configured at 10 dB RF slope, +48 dBmV / port @ -1 dBm optical input.

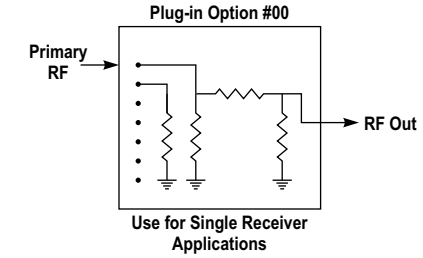
*Optional Pad & EQ accessories needed for different performance values.*

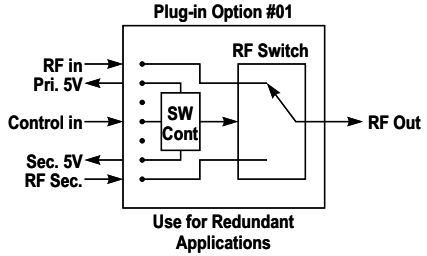


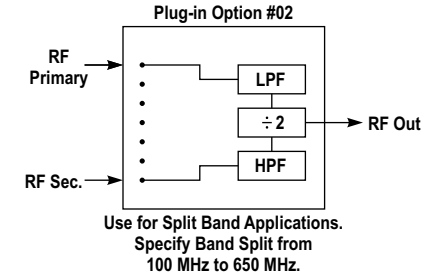

Red outlines above show RF signal path configuration locations. Tall JXP-0 pads control the signal flow in forward and reverse directions. One RF input and four output ports shown, with 2x2 and 4x4 possible.

# OTMN-III
# FORWARD RECEIVER DIAGRAM



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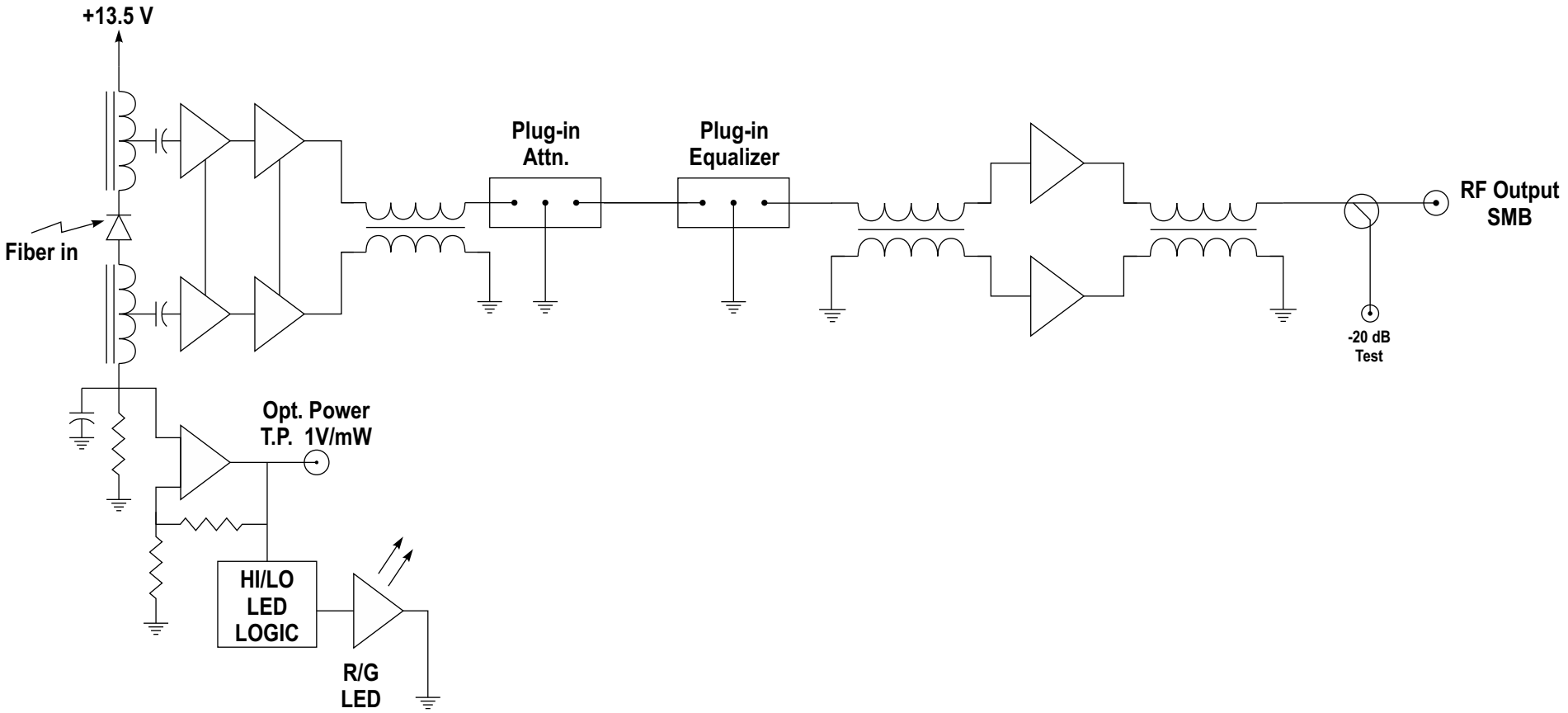

# OTMN-III
# RETURN LASER TRANSMITTER