

Opti Max™ Optical Node Series

OM4100 Optical Receivers

FEATURES

- High performance enables migration to Fiber Deep designs
- Low-noise performance improves link CNR
- Wide optical input range overcomes multiwavelength passive loss
- Optical AGC simplifies redundant node operation
- Service Interruption Protection allows adjustments without interrupting RF



PRODUCT OVERVIEW

The OM4100 1 GHz optical receiver series enables operators to maximize network flexibility and deploy cost-saving system designs. The series includes both standard gain and high-gain options to optimize fiber deep architectures. Both options use an integrated optical hybrid photo detector and Enhanced Gallium Arsenide (E-GaAs) technology to improve RF performance over the entire 1 GHz passband.

OM4100 high-gain receivers provide a wide optical input range and low EIN value, enabling system designs with lower optical input levels to maintain typical RF output and improve link CNR. This allows the receiver to overcome multiwavelength passive loss, eliminating the need for costly optical amplifiers in the network.



OM4100 high gain receivers feature Optical Automatic Gain Control (OAGC), which maintains a constant RF level as the optical input level changes. OAGC simplifies redundant node operation, wherein a secondary fiber level often differs from the primary path. A mode select switch, located on the right side of the receiver, allows operators to select either the fiber deep OAGC optical input range of –6 to 0 dBm or the more traditional HFC range of –3 to 3 dBm. Operators can also set the receiver to operate in a Thermal Level Control (TLC) mode, in which adjustments are made only for changes to the internal temperature of the receiver and RF output levels change with Optical input levels.

OM4100 high gain receivers install, test, and maintain easily, providing technicians with an Optical Power DC test point and Optical Power LED as well as a -20 dB RF Test Point and RF Output LED. Maintenance is also simplified by the Service Interruption Protection feature, which allows the technician to select and change the value of the receiver’s RF balancing PAD without interrupting the RF output. The attenuation value of the previously installed balancing PAD remains in the receiver’s memory and is maintained until the technician installs a new PAD.

The receivers are monitored in one of two ways: via the optional DOCSIS status monitoring transponder or, in nodes equipped with 2x42 MHz Digital Return, via Digital Element Management System (DEMS) and the CORView™ management system.

SPECIFICATIONS		
Characteristic	Standard Gain Rx	High Gain Rx
Optical		
Optical Wavelength, nm	1290 to 1620	1270 to 1620
Optical Input Return Loss, dB, min.	45	45
Equivalent Noise Input, pA/Hz ^{0.5}	8.5	5.0
Optical Input Range, dBm ¹	–3 to 3	–3 to 3 and –6 to 0
Optical Power Threshold Alarm Limits, dBm	User-settable: –13 to 2	User-settable: –10 to 1
RF		
Impedance, Ohms	75	75
Frequency Range, MHz	40 to 1002	50 to 1006
Slope, dB	8 ± 0.5 ²	8 ± 0.5
Flatness, dB	± 0.5 ³	± 0.5 ⁴
Return Loss, dB min.	16.0	16.0
RF Output Level, dBmV, min.	37.0 ⁵	43 ⁶
Thermal Stability, dB ⁷	± 1.5	± 1.5
Test Point		
Output RF Test Point, dB	–20 ± 0.75	–20 ± 1
Optical Power Monitor	1V/mW ± 10%	1V/mW ± 10%
Optical Threshold Test Point	1V/mW	1V/mW
79 NTSC Channel Performance Specifications @ Recommended Levels, typ.⁸		
Frequency, MHz	1002/870/550/54	1002/870/550/54
Output Level, dBmV	37.0/36.0/33.2/29.0	43/42/39.2/35
Carrier to Noise Ratio, 4 MHz, 75 Ohm, dB	59	59
Composite Triple Beat, –dBc	80	80
Cross Modulation, per NCTA std., –dB	75	75
Composite 2IM, –dBc	70	70
Composite Intermodulation Noise CIN, dB ⁹	73	70

SPECIFICATIONS CONTINUED

Characteristic	Standard Gain Rx	High Gain Rx
LED Indicators		
On/Off (ON/OFF)	Green: RF output on Off: RF output off	—
Optical Power Threshold (OPT PWR THRESHOLD)	Green: optical input above threshold Off: optical input below threshold	—
DC Power (+24V)	Green: DC power okay Off: DC power failure	—
Optical Power (OPT PWR)	—	Green: within optical input range Amber: near optical input limit Red: outside optical input range
RF Output (RF OUT)	—	Green: RF output good Blinking Amber: Exceeded 6 dB attenuation limit of RF Balancing PAD Red: no RF output
Powering Requirements		
Supply Voltages, Vdc	24/5	24/12/5
DC Current, mA, max.	510/<5	270/10/415
Power Consumption, W, max.	12.25	8.7
Environmental		
Operating Temperature (node) ⁷	−40° to 60°C (−40° to 140°F)	−40° to 60°C (−40° to 140°F)
Storage Temperature	−40° to 85°C (−40° to 185°F)	−40° to 85°C (−40° to 185°F)
Relative Operating Humidity, %, non-condensing	95	95
Gain Control		
Plug-in PADs	NPB-000 to NPB-200 (0–20 dB)	NPB-000 to NPB-060 (0–6 dB) ¹⁰

NOTES:

1. Circuit resiliency to +5 dBm.
2. Slope is linear and measured from 54 to 1002 MHz.
3. Flatness is measured with respect to slope.
4. Flatness is factory aligned with 6 dB of attenuation and measured with respect to slope.
5. RF output level is 37.0 dBmV minimum @ 1002 MHz with a −3.0 dBm received power, transmitter OMI of 3%, and an NPB-000 attenuator installed.
6. RF output level is minimum @ 1006 MHz with −3 dB received power, transmitter OMI of 3.0%.
7. The receiver module is designed to operate in a node application with external ambient temperature ranging from −40° to 60°C. The high gain receiver combines AGC (if selected), thermal stability, and overall attenuation.
8. The distortion values listed are for the receiver only. To obtain a particular link performance, combine the listed receiver performance values with the applicable transmitter performance values.
9. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 54 to 550 MHz frequency spectrum. Distortion values are typical with an input of 0 dBm @ 3.5% OMI.
10. Plug-in PAD provides service interruption protection. Attenuation will change after a new value of PAD is installed. For optimum performance while in AGC mode, do not exceed 6 dB of plug-in attenuation.



ORDERING INFORMATION

Part Number	Mfg Number	Description
723990	1500209-001	Standard Gain OM4100 1 GHz Optical Receiver SC/APC
800315	1500209-005	High Gain OM4100 1 GHz Optical Receiver SC/APC

Call for quotes regarding additional connector options.

RELATED PRODUCTS

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Control Module	Installation Services

Customer Care

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Note: Specifications are subject to change without notice.

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Nodes-OM4100