



Opti Max™ 31xx Series Multi Functional Node

OM3101 — 1 GHz Multiple Output Digitally Segmentable Node

Philips 9-NH 4 Port Housing Base

OM3101 (42/54 MHz Split) Node Specifications

Characteristic	Specification
Number of RF/AC Ports	4
Number of AC Only Ports	1, Optional
Housing Passband, MHz	1002
Port Impedance, Ω	75
AC Current Passing, A (All Ports)	15
Operating Temperature Range, °C (°F)	-40 to 60 (-40 to 140)
Forward Path Specifications	
Optical Specifications	
Optical Input Wavelength, nm	1260 to 1620
Optical Input Range, dBm ¹	-3 to 3
Equivalent Input Noise, pA/Hz ^{0.5}	4.5
OPT POWER LED	On: Optical Input > -10 \pm 1.5 dBm, Off: Optical Input Power < -10 \pm 1.5 dBm
Receiver Optical Input Testpoint Level	1V/mW \pm 10%
RF Specifications	
Operating Passband, MHz	54 to 1002
Maximum Output Level @ 1002 MHz, dBmV	60 (2 outputs); 56 (4 outputs)
Minimum Output Level @ 1002 MHz, -3 dBm input, 3.5% OMI, dBmV	56 (2 outputs); 52 (4 outputs)
Level Stability, dB, max.	\pm 1.5
Gain Slope, dB ²	17 \pm 1.0
Flatness @ Gain Slope, dB	\pm 1.0
Return Loss, dB, min.	16.0 (15 dB when configured to 2 outputs)
RF Output Testpoint Level, dB	-20 \pm 0.75
79 NTSC Channel Performance³	
Channel Loading, # of NTSC channels ⁴	79
Frequency, MHz	1002/870/550/54
Output Level, dBmV ⁵	52/49.7/43.9/35 (4 outputs); 56/53.7/47.9/39 (2 outputs)
Carrier to Noise Ratio, 4 MHz, 75 Ω , dB	62
Composite Triple Beat, -dBc	70
Composite 2IM, -dBc	67
Cross Modulation, per NCTA std., -dB	66

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Opti Max3101 (42/54 MHz Split) Node Specification (Continued)

Characteristic	Specification
Composite Intermodulation Noise, dB ⁶	61
Composite Intermodulation Noise, dB ⁷	67
Chrominance to Luminance Delay	
Channel 2, ns max./3.58 MHz	20
Channel 3, ns max./3.58 MHz	10
Channel 4, ns max./3.58 MHz	7
Channel 5, ns max./3.58 MHz	4
Hum Modulation (Time Domain @ 15 A)	
54 to 1002 MHz, dB	60
Gain Control, plug-in PADs ⁸	10-Ax-WC (0–26 dB) in 1.0 dB steps
Equalization ⁸	
1 GHz	GEQL-1GHZ-020-1 to GEQL-1GHZ-130-1 (2–13 dB) in 1.0 dB steps
870 MHz	GEQL-870-020-1 to GEQL-870-130-1 (2–13 dB) in 1.0 dB steps
Return Path Specifications	
RF Specifications	
Operating Passband, MHz	5 to 42
Optimum RF Input Level, dBmV/6 MHz	12
Gain Slope, dB	± 1.0
Flatness @ Gain Slope, dB	± 1.0
Return Loss, dB, min.	16.0
Port to Port Isolation, dB, typ.	50
RF Input Testpoint Level, dB	–20 ± 0.75
Group Delay	
5.5 to 7 MHz, ns, max.	60
38.5 to 40 MHz, ns, max.	20
Hum Modulation (Time Domain @ 15 A)	
5 to 10 MHz, dB	55
11 to 42 MHz, dB	60
Gain Control, plug-in PADs ⁸	10-A0.0-WC to 10-A26.0-WC (0–26 dB, in 1.0 dB steps)
OM3101 w/ Isolated 1310 DFB and 1550 DFB TX Specifications	
Transmitted Wavelength, nm	1310 ± 20, 1550 ± 25
Output Power, @ connector output, dBm ⁹	3.0 ± 1.0
RF Testpoint Level, dB referenced to Tx input	–9 ± 0.5
Link RF Level Stability, dB, max.	± 2.5
NPR Dynamic Range, dB, @ >35 dB NPR ^{10,11}	15
BER Dynamic Range, 16-QAM/64-QAM, dB ^{10,11}	35/25
OM3101 w/ Isolated CWDM DFB Analog TX Specifications	
Transmitted Wavelength, nm	1471 to 1611 ± 6.5 nm (8 CWDM channels, 20 nm spacing)
Output Power, @ connector output, dBm ⁹	3.0 ± 1.0
RF Testpoint Level, dB referenced to Tx input	–9 ± 0.5
Link RF Level Stability, dB, max.	± 2.5
NPR Dynamic Range, dB, @ > 35 dB NPR ^{10,11}	15
BER Dynamic Range, 16-QAM/64-QAM, dB ^{10,11}	35/25
OM3101 w/ 2:1 Digital Return Processing Module with SFP Specifications	
Transmitted Wavelength, nm	Refer to SFP Specifications
Output Power, @ connector output, dBm ⁹	Refer to SFP Specifications
RF Testpoint Level, dB referenced to Tx input	–9 ± 1.0
Data Rate, Gbps	2.488
Link RF Level Stability, dB, max.	± 1.5
NPR Dynamic Range, dB, @ > 40 dB NPR ^{11,12}	16
BER Dynamic Range, 16-QAM/64-QAM, dB ^{11,12}	34/28
Link Gain, dB ¹³	30

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Opti Max3101 (42/54 MHz Split) Node Specification (Continued)

Characteristic	Specification			
	DC Curr. (mA, max.) 24 V	DC Pwr (W)	AC I/P Curr. @ 60/90 V (A)	AC I/P Pwr (W)
w/ 1310/1550 nm Analog or 2:1 Digital Return Tx	1.5	36	0.75/0.62	41
w/ Analog CWDM Tx	1.85	44.2	0.92/0.72	50.7

Specification Document Number 1506802 Rev A

1. Circuit resiliency to 5 dBm.
2. Typical slope is 17 dB when configured for four outputs with GEQL-1GHZ-100-1 installed and typical slope is 8 dB with no EQ installed. Slope is defined as the difference between the highest and lowest specified frequency on a straight line determined by applying a best fit/least squared formula to the measured response.
3. The distortion values listed are for the node only @ 0 dBm equivalent input level and configured for 2 outputs. To obtain a particular link performance, combine the listed node performance values with the applicable transmitter performance values.
4. Analog channels occupying the 54 to 550 MHz frequency range with digitally compressed channels or equivalent broadband noise to 1002 MHz at levels 6dB below equivalent video channels.
5. At the specified operational tilt of 17.0 dB, the maximum output level for 870 MHz or 1002 MHz loading is 60 dBmV at the highest frequency and configured for 2 outputs.
6. 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.
7. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 870 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.
8. ARRIS accessories should be used for guaranteed performance; using third party accessories may result in degraded and/or intermittent performance.
9. Measured at the output of the bulkhead connector.
10. All performance specifications measured over a 6 dB (pure glass) fiber link using an optical receiver causing no degradation to performance.
11. NPR performance is measured using 37 MHz noise loading. Bit Error Rate (BER) performance is measured using one 16-QAM and four 64-QAM channel with a BER of $< 10^{-6}$.
12. System specifications with up to 100 km fiber link and CHP-D1RRX receiver.
13. From input of node port to output of CHP-D1RRx, with CHP-D1RRx receiver set at maximum gain.

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2:1 Digital Return Processing Module Specifications

Characteristic	Specification ¹
Optical Specifications	
A standard, industrial temperature range DWDM, CWDM, 1310 nm, or 1550 nm SFP with a data rate of 2.488 Gb/s or higher must be plugged into an OM3DTX-SFP series digital processing module.	
RF Specifications, each channel	
RF Bandpass, MHz	5 to 42
RF Digitizing Resolution	10 (12 companded)
Data Rate, Gb/s	2.488
Flatness, dB ²	± 0.50
Gain Slope, dB ³	0 ± 0.25
RF Gain Stability Over Temperature, dB	± 1.5
Input and Testpoint Impedance, Ohms	75
Input and Testpoint Return Loss, dB, min.	16
RF Testpoint from Transmitter Input, dB	-9 ± 1.0
LED Indicators	
LED State	
No optical input signal detected since SFP has been installed	Rx STATUS = Off
Optical input signal detected and lost since SFP has been installed in the module, or optical input signal detected but receiver lock not achieved since SFP has been last installed in the module	Rx STATUS = Solid Red
Optical input signal detected, receiver locked to incoming signal, bit errors detected	Rx STATUS = Flashing Red
Optical input signal present, receiver locked to incoming signal, no bit errors detected	Rx STATUS = Solid Green
Transmitter 1 operating normally	Tx1 STATUS = Solid Green
RF input 1 in over-drive (ADC clipping)	Tx1 STATUS = Flashing Red
Transmitter 2 operating normally	Tx2 STATUS = Solid Green
RF input 2 in over-drive (ADC clipping)	Tx2 STATUS = Flashing Red
No alarms	Rx STATUS, Tx1 STATUS, Tx2 STATUS = Solid green
Powering Specifications	
Power Consumption, W, typ.	5
Temperature Range	
Digital Processing module Operating Temperature, °C (°F)	-40 to 60 (-40 to 140)
System Specifications⁴	
NPR Peak, dB, typ./min.	50/48
Dynamic Range @ § 40 dB NPR, dB, typ./min.	16.5/15
BER Dynamic Range @ < 10 ⁻⁶ BER, dB	28 (64-QAM), 34 (16-QAM), 45 (QPSK)
Link Gain, dB ⁵	31
Link Flatness, dB, typ./max.	± 0.75/±1.00

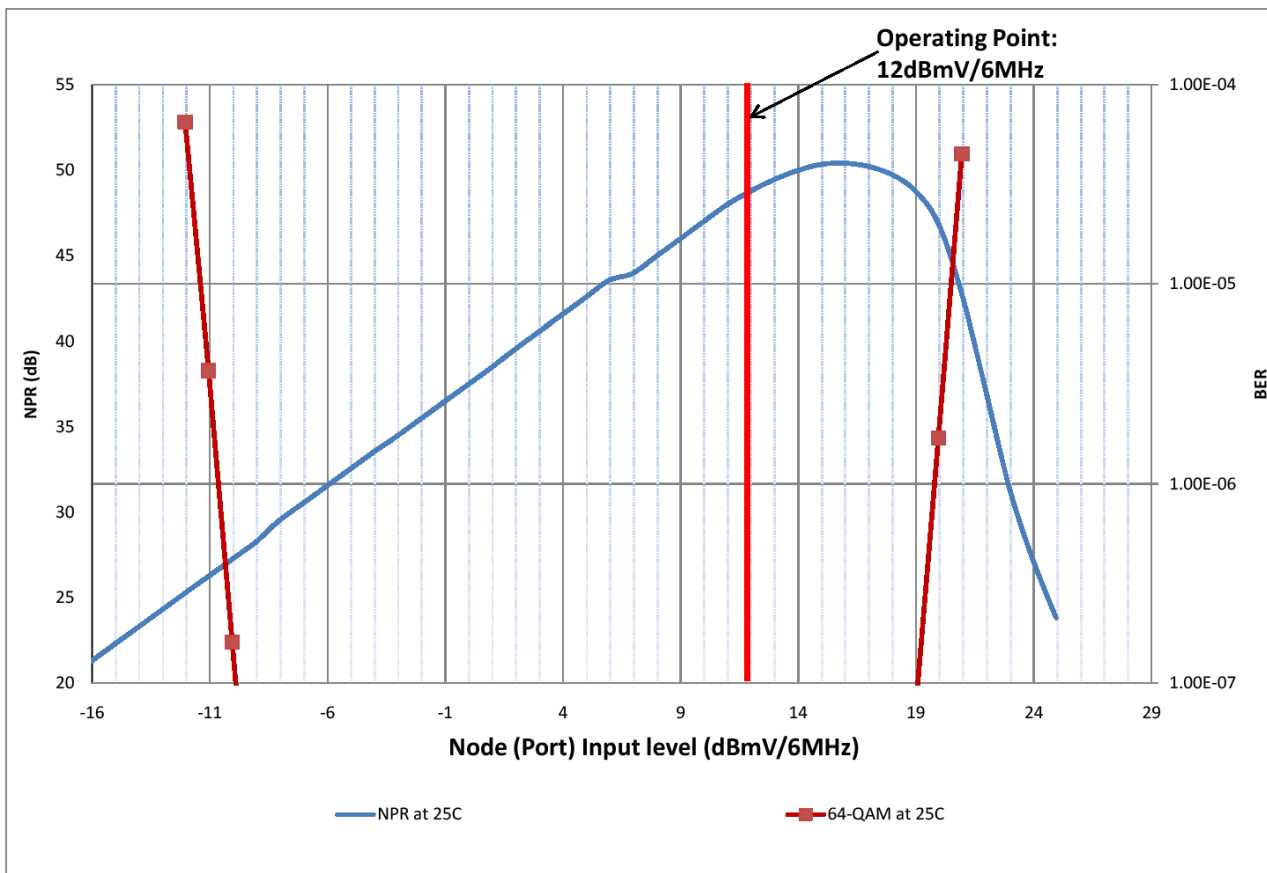
- ARRIS guarantees digital return link performance specification only when using an ARRIS supplied SFP.
- Flatness is measured with respect to gain slope. Measured from 5-100 MHz.
- Gain slope is measured as a straight line from 5 to 42 MHz.
- System specifications with up to 100 km fiber link.
- With maximum gain at receiver, from input of transmitter to the output of the receiver.

Opti Max3101 Technical Specification

NPR/BER Curve Obtained Using a 2:1 TDM Digital Return Processing Module Installed in an OM3101 Node with a DWDM SFP through a 100km SMF, and fully loaded from 5 to 42MHz with six 64-QAM Channels.

Refer to the Opti Max3101 Equipment Manual (P/N 1506816) for complete specifications. Specifications are subject to change without notice.

OM3101 NPR/BER 64-QAM Curve with 2:1 TDM Digital Return Processing Module and SFP

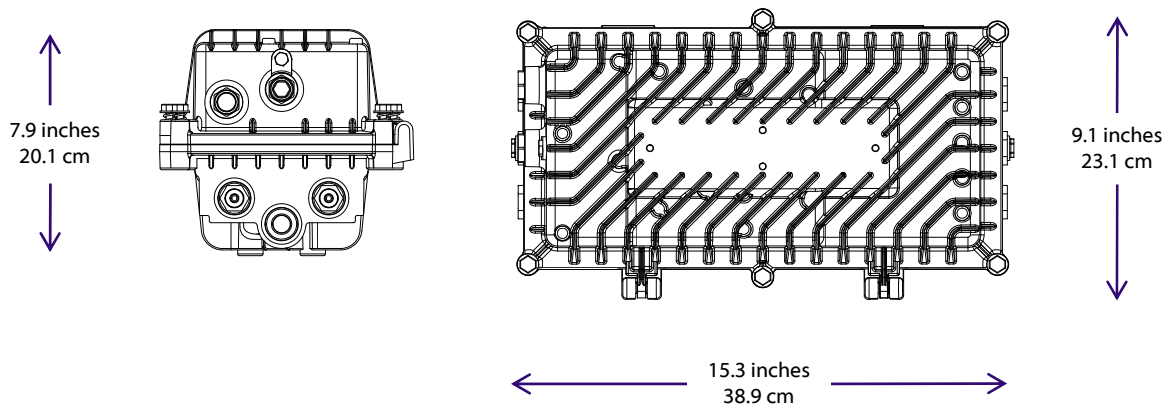


Opti Max3101 Technical Specification

Opti Max3101 Physical Specifications

Characteristic	Uncrated Measurements	Crated Measurements
Width	15.3 inches (38.9 cm)	19.31 inches (49.0 cm)
Height	7.9 inches (20.1 cm)	12.0 inches (30.5 cm)
Depth	9.1 inches (23.1 cm)	13.25 inches (33.7 cm)
Weight	19.24 pounds (8.73 kg) ¹	22.32 pounds (10.12 kg) ¹

1. Approximate weight for a fully-configured node built with one NRT.



Ordering Information

To configure a product that meets your specific needs, or for any questions, please contact your ARRIS Sales Professional. You may also use our Product Wizard, located at support.arrisi.com (User ID and password required). If you do not have a user ID and password or have forgotten your password, please use the Sign In Help section indicated.

Specifications are subject to change without notice.

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