



NoviConnect™ 504 SFP+ LR Transceiver



NoviConnect 504: This Industry Standard 10GBase-LR SFP+ Transceiver operates at 1310nm over Single-Mode Fiber, with a maximum reach of 10km connected via a LC connector, is certified for optimal performance with NoviFlow switching products, and is fully compliant with MSA (Multi-Source Agreement) standards. All *NoviConnect* products from NoviFlow are 100% functionally tested to ensure trouble-free installation and operation when used

with NoviFlow's NoviSwitch and NoviKit network products.

NoviConnect Transceivers are factory programmed with specific configuration data required for seamless networking compliance and for optimal network performance when used with NoviFlow switching products. These transceivers can be mixed and connected to devices with MSA industry standard compliant transceivers, for outstanding network performance.

NoviFlow Inc.™ aims to change the traditional approach to networking by making switching smarter. The company was founded to deliver upon the promise of SDN. Our SDN data plane products combine the benefits of virtualization and programmability with network processors that can handle complex flows, making it possible for data center and network operators to keep up with today's exponentially growing networking demand. In order to ensure the highest levels of network performance, seamless compatibility and trouble-free upgrades with our NoviSwitch and NoviKit products, NoviFlow offers a complete line of high-performance and cost-effective SFP transceiver modules.

PRODUCT DESCRIPTION

The *NoviConnect 504 SFP+ LR Transceiver* (10 Gbps over fiber) is a high performance, cost effective module supporting dual data-rate of 10Gbps and supporting distances up to 10km with SMF.

REGULATORY COMPLIANCE

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.7.
- ESD to the Duplex LC Receptacle: compatible with IEC 61000-4-2 GR-1089-CORE.
- Immunity compatible with IEC 61000-4-3.
- EMI compatible with FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B.
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2.
- RoHS compliant with 2002/95/EC 4.1&4.2 2005/747/EC.

Key Features:

- Duplex LC connector
- Support hot-pluggable
- Metal with lower EMI
- Excellent ESD protection
- DFB Transmitter and PIN Receiver
- Distance up to 10km on 9/125um SMF
- Single 3.3V power supply and Low power dissipation <1.2W
- GR-253-CORE compliant
- RoHS Compliant and Lead-Free
- Compliant with IEEE 802.3ae
- Compliant with SFP+ MSA: SFF-8431 Rev4.1
- Digital diagnostic compatible with SFF-847 Rev11.0
- Compliant with SFF-8472 Rev.11.0

RECOMMENDED OPERATING CONDITIONS

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NoviConnect 504 SFP+ LR Data Sheet

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Supply Voltage	Vcc	3.13	3.30	3.47	V
Power Supply Current	Icc			350	mA
Case Operating Temperature – Commercial	Tc	-5		70	°C
Case Operating Temperature – Industrial	Tc	-40		85	°C
9/125µm SMF	Lmax			10	km

ELECTRICAL CHARACTERISTICS

PARAMETER	SYM BOL	MIN.	TYP.	MAX.	UNIT
TRANSMITTER					
Differential data input swing	V _{in, pp}	120	600	850	mV
Input differential impedance	Z _{in}	90	100	110	Ω
TX Disable-High		2.0		V _{cc} +0.3	V
TX Disable-Low		V _{ee} -0.3		0.8	V
TX Fault-High		2.0		V _{cc} +0.3	V
TX Fault-Low		V _{ee} -0.3		0.8	V
RECEIVER					
Differential data output swing	V _{out, pp}	300	600	850	mV
Output Differential Impedance	Z _{in}	90	100	110	Ω
LOS-High		2.0		V _{cc} +0.3	V
LOS-Low		V _{ee} -0.3		0.8	V

DIGITAL DIAGNOSTIC MONITORING INTERFACE

The digital diagnostic monitoring interface also defines another 256-byte memory map in EEPROM, which makes use of the 8 bi address 1010001X (A2h). The monitoring specification of this product is described in this table.

PARAMETER	RANGE	ACCURACY	CALIBRATION
Temperature	-5°C to 85°C	±3°C	Internal
Voltage	2.97V to 3.63V	±3%	Internal
Bias Current	0mA to 100mA	±10%	Internal
TX Power	-6dBm to 0.5dBm	±2dB	Internal
RX Power	-14dBm to 0.5dBm	±2dB	Internal

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Maximum Supply Voltage	Vcc	-0.5	4.0	V
Storage Temperature	TS	-40	85	°C
Operating Humidity	RH	5	95	%

OPTICAL CHARACTERISTICS

PARAMETER	SYM BOL	MIN.	TYP.	MAX.	UN IT	N OTES
TRANSMITTER						
Output Opt. Power	PO	-6		0.5	dBm	1
Optical modulation amplitude	P(O MA)	-5.2	-2		dBm	
Extinction Ratio	ER	3.5			dB	
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Average Launch power OFF TX	P _{off}			-30	dBm	
Optical Wavelength	λ	1260	1310	1355	nm	
Side mode Suppression Ratio	SMSR	30			dB	
Optical Return Loss Tolerance	ORLT			12	dB	
Relative Intensity Noise	RIN			-128	dB /Hz	
Transmitter Reflectance				-12	dB	
Eye Diagram	Compatible with IEEE 802.3-2005					
RECEIVER						
Overload		0.5			dBm	1
Optical Center Wavelength	λ _C	1270		1600	nm	1
LOS De-Assert	LOS _D			-15	dBm	
LOS Assert	LOS _A	-30			dBm	
LOS Hysteresis		0.5		5	dB	
Receiver Sensitivity	PIN			-14.4	dBm	

NOTES:

- BER ≤ 10⁻¹²@PRBS231-1 at 10.3125Gb/s.

RATE SELECTION

The SFP+ module provides two inputs RS0 and RS1 that can optionally be used for rate selection. This rate select functionality can also be controlled by software as defined by SFF-8472. Optionally the rate select methods of Part 2 SFF-8079 may be used instead of the method described here by setting the management declaration bit (A0h byte 93 bit 2) to 1, see SFF-8472.

PARAMETER	STATE	CONDITIONS
RS0	Low	Rx signally rate less than or equal to 4.25GBd.
	High	Rx signally rate great than 4.25GBd.
RS1	Low	Tx signally rate less than or equal to 4.25GBd.
	High	Tx signally rate great than 4.25GBd.

Ordering information: Model number 40000504

For more information, please visit www.noviflow.com™ or e-mail us at contact@noviflow.com.

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