NoviConnect™ 515 40G QSFP+ LR Transceiver

NoviConnect 515. This Industry Standard 40GBase-LR4 QSFP+ Transceiver operates four independent full-duplex channels, offers up to 11.2Gbps data rate per wavelength, with a reach of up to 10km transmission on SMF, 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 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 products, NoviFlow offers a complete line of high-performance and cost-effective SFP transceiver modules.

Key Features:

- 4 CWDM lanes MUX/DEMUX design
- 4 independent full-duplex channels
  Up to 11.2Gbps data rate per wavelength
- 4 CWDM channels are 1271, 1291, 1311 and 1331nm
- Single +3.3V power supply
- Up to 10km transmission reach
- Operating case temperature: 0°C~70°C
- Maximum 3.5W operation power
- RoHS compliant
- Compliant with IEEE802.3ba
- Compliant with QSFP+ MSA: SFF-8436

PRODUCT DESCRIPTION

The NoviConnect 515 40G QSFP+ LR4 Transceiver is a high performance, cost effective module supporting 40 Gigabit Ethernet and up to 10km transmission distance with single mode fiber (SMF).

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Current	Icc			100	mA
Case Operating Temp.	Tc	-5		70	°C

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Storage Temperature	TS	-40		85	°C
Relative Humidity	RH	0		85	%
Supply Voltage	VCC	-0.5		4.0	V

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Consumption (XLPPI)				1.5	W	
Supply Current	ICC		0.75	1.0	A	
Control I/O Voltage, High	VIH	2.0		VCC	V	
Control I/O Voltage, Low	VIL	0		0.7	V	
Inter-Channel Skew	TSK			150	ps	
RESETL Duration			10		us	
RESETL De-assert time				100	ms	
Power on time				100	ms	
Transmitter						
Single Ended Output Voltage Tolerance		-0.3		4	V	
AC Common mode Voltage Tolerance (RMS)		15			mV	
Tx Input Diff Voltage	VI	90		1600	mV	
Tx Input Diff Impedance	ZIN	80	100	120	Ω	
Differential Input Return Loss	See IEEE 802.3ba 86A.4.11				dB	10MHz-11.1GHz
J2 Jitter tolerance	Jt2			0.18	UI	
J9 Jitter Tolerance	Jt9			0.26	UI	
Data Dependent Pulse Width Shrinkage	DDPWS			0.07	UI	
Eye Mask Coordinates X1, X2, Y1, Y2	0.1. 0.31, 95, 350					
Receiver (XLPPI)						
Single Ended Output Voltage Tolerance		-0.3		4	V	Preferred to TP1 signal common
AC Common mode Voltage Tolerance (RMS)				7.5	mV	
Termination Mismatch at 1MHz				5	%	
Differential Output Return Loss	See IEEE 802.3ba 86A.4.2.1				dB	10MHz-11.1GHz
Common-mode Output Return Loss	See IEEE 802.3ba 86A.4.2.1				dB	10MHz-11.1GHz
Rx Output Diff Voltage	Vo		600	800	mV	
Rx Output Rise and Fall Time	Tr/Tf			35	ps	20% to 80%
J2 Jitter Tolerance	Jr2			0.46	UI	
J9 Jitter Tolerance	Jr9			0.63	UI	
Eye Mask Coordinates X1, X2, Y1, Y2	0.29, 0.5, 150, 425				UI mV	

Note:

1. The single ended input voltage tolerance is the allowable range of the instantaneous input signals

OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTES
Wavelength Assignment	L0	1264.5	1271	1277.5	nm	
	L1	1284.5	1291	1297.5	nm	
	L2	1304.5	1311	1317.5	nm	
	L3	1324.5	1331	1337.5	nm	
Transmitter						
Side Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	PT			8.3	dBm	
Average Launch Power, each Lane		-7		2.3	dBm	
Optical Modulation Amplitude (OMA), each Lane	OMA	-4		3.5	dBm	1
Difference in Launch Power between and Two Lanes (OMA)				6.5	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane		-4.8			dBm	
TDP, each Lane	TDP			2.3	dB	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise	Rin			-128	dB/Hz	
Optical Return Loss Tolerance				20	dB	
Transmitter Reflectance	RT			-12	dB	
Transmitter Eye Mask Definition X1, X2, X3, Y1, Y2, Y3		Specification Values 0.25, 0.4, 0.45, 0.25, 0.28, 0.4				
Average Launch Power OFF Transmitter, each Lane	Poff			-30	dBm	
Receiver						
Damage Threshold	THd	3.3			dBm	1
Average Power at receiver Input, each Lane		-13.7		2.3	dB	
Receiver Reflectance	RR			-26	dB	
Receiver Power (OMA), each Lane				3.5	dBm	
Stressed Receiver Sensitivity in OMA, each Lane				-9.9	dBm	
Receiver Sensitivity, each Lane	SR			-11.5	dBm	
Difference in Receive Power between any Lanes (OMA)				-7.5	dBm	
Conditions of Stress Receiver Sensitivity Test						
Vertical Eye Closure Penalty, each Lane			1.6		dB	
Stressed Eye Jitter, each Lane			0.3		UI	

Note:

1. Even if the TDP<0.8 dB, the OMA min must exceed the minimum value specified here.
2. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.
3. Measured with conformance test signal at receiver input for BER= 1x10-12.
4. Vertical eye closure penalty and stressed eye jitter are test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

ORDERING INFORMATION MODEL NUMBER 400000515

FOR MORE INFORMATION

www.noviflow.com | contact@noviflow.com