

### 160-9002-900-PRO

Ciena® 160-9002-900 Compatible TAA Compliant 10GBase-DWDM 50GHz XFP Transceiver (SMF, 1530nm to 1565nm, 80km, DOM, 0 to 70C, LC)

#### Features

- INF-8077i Compliance
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



#### Applications:

- 10x Gigabit Ethernet over DWDM
- 8x/10x Fibre Channel
- Access, Metro and Enterprise

#### Product Description

This Ciena® 160-9002-900 compatible XFP transceiver provides 10GBase-DWDM throughput up to 80km over single-mode fiber (SMF) using a wavelength of 1530nm to 1565nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Ciena® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Proline's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products.



## Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4
- ESD to the LC Receptacle: compatible with IEC 61000-4-3
- EMI/EMC compatible with FCC Part 15 Subpart B Rules, EN55022:2010
- Laser Eye Safety compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

## Tunable XFP Channel Number and Wavelength

Channel No.	Frequency (THz)	Center Wavelength	Channel No.	Frequency (THz)	Center Wavelength
1	191.35	1566.723	49	193.75	1547.316
2	191.40	1566.314	50	193.80	1546.917
3	191.45	1565.905	51	193.85	1546.518
4	191.50	1565.496	52	193.90	1546.119
5	191.55	1565.087	53	193.95	1545.720
6	191.60	1564.679	54	194.00	1545.322
7	191.65	1564.271	55	194.05	1544.924
8	191.70	1563.863	56	194.10	1544.526
9	191.75	1563.455	57	194.15	1544.128
10	191.80	1563.047	58	194.20	1543.730
11	191.85	1562.640	59	194.25	1543.333
12	191.90	1562.233	60	194.30	1542.936
13	191.95	1561.826	61	194.35	1542.539
14	192.00	1561.419	62	194.40	1542.142
15	192.05	1561.013	63	194.45	1541.746
16	192.10	1560.606	64	194.50	1541.349
17	192.15	1560.200	65	194.55	1540.953
18	192.20	1559.794	66	194.60	1540.557
19	192.25	1559.389	67	194.65	1540.162
20	192.30	1558.983	68	194.70	1539.766
21	192.35	1558.578	69	194.75	1539.371
22	192.40	1558.173	70	194.80	1538.976
23	192.45	1557.768	71	194.85	1538.581
24	192.50	1557.363	72	194.90	1538.186
25	192.55	1556.959	73	194.95	1537.792
26	192.60	1556.555	74	195.00	1537.397
27	192.65	1556.151	75	195.05	1537.003

<b>28</b>	192.70	1555.747	<b>76</b>	195.10	1536.609
<b>29</b>	192.75	1555.343	<b>77</b>	195.15	1536.216
<b>30</b>	192.80	1554.940	<b>78</b>	195.20	1535.822
<b>31</b>	192.85	1554.537	<b>79</b>	195.25	1535.429
<b>32</b>	192.90	1554.134	<b>80</b>	195.30	1535.036
<b>33</b>	192.95	1553.731	<b>81</b>	195.35	1534.643
<b>34</b>	193.00	1553.329	<b>82</b>	195.40	1534.250
<b>35</b>	193.05	1552.926	<b>83</b>	195.45	1533.858
<b>36</b>	193.10	1552.524	<b>84</b>	195.50	1533.465
<b>37</b>	193.15	1552.122	<b>85</b>	195.55	1533.073
<b>38</b>	193.20	1551.721	<b>86</b>	195.60	1532.681
<b>39</b>	193.25	1551.319	<b>87</b>	195.65	1532.290
<b>40</b>	193.30	1550.918	<b>88</b>	195.70	1531.898
<b>41</b>	193.35	1550.517	<b>89</b>	195.75	1531.507
<b>42</b>	193.40	1550.116	<b>90</b>	195.80	1531.116
<b>43</b>	193.45	1549.715	<b>91</b>	195.85	1530.725
<b>44</b>	193.50	1549.315	<b>92</b>	195.90	1530.334
<b>45</b>	193.55	1548.915	<b>93</b>	195.95	1529.944
<b>46</b>	193.60	1548.515	<b>94</b>	196.00	1529.553
<b>47</b>	193.65	1548.115	<b>95</b>	196.05	1529.163
<b>48</b>	193.70	1547.715	<b>96</b>	196.10	1528.773

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Tstg	-40		85	°C	
Case Temperature		-5		70	°C	
ESD		500			V	High Speed i/o pins
		2000				All other pins
Receiver optical input power				+12	dBm	

### Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
1.8V Supply	Vcc2	1.71	1.8	1.89	V	VPS not supported
3.3V Supply	Vcc3	3.15	3.3	3.45	V	
5.0V Supply	Vcc5	4.75	5.0	5.25	V	
Supply Current, 1.8V			160	200	mA	
Supply Current, 3.3V			310	400	mA	
Supply Current, 5.0V			100	200	mA	
Inrush current limit				100	mA/μs	
Total power consumption				2.5	W	Power Level 2 MSA classification

### System Performance

Parameter	Min	Max	OSNR	BER	Conditions
Noise Loaded	-400ps/nm	1500ps/nm	19dB	1E-04	10.709Gb/s, -10 to -20dBm, 0.25nm filter, optimised RxDTV
Unamplified Links	0ps/nm	1600ps/nm	>35dB	1E-12	10.709Gb/s, -22dBm, 0.25nm filter, optimised RxDTV

## Optical Characteristics

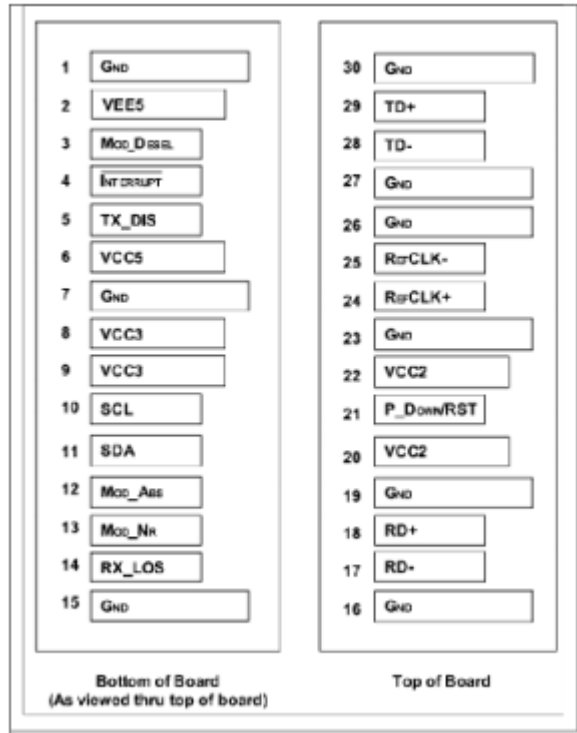
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
<b>Transmitter</b>						
Data Rate		9.95		11.35	Gb/s	NRZ
Frequency range		191.35		196.10	THz	50GHz grid, 96 channels
Frequency accuracy		-2.5		+2.5	GHz	EOL
Optical transmit power	Po		+0.5		dBm	SOL, 25°C
Optical transmit power	Po	-1		+3.0	dBm	EOL
Shuttered output power			-45	-40	dBm	
Optical power stability	$\Delta P_{out}$	-1.0		+1.0	dB	All channels, SOL
Side mode suppression	SMSR	35			dB	$\pm 2.5$ nm, modulated
Spectral width	$\Delta\lambda$		0.3	0.5	nm	-20dB, modulated
Extinction ratio	ER	9.5			dB	Filtered, 10.709Gb/s
Eye diagram compliance	GR-253, ITU-T G.691					
Mask margin		10			%	
OSNR		50	55		dB	0.1nm RBW
SBS threshold		18			dBm	50km SMF
Tuning speed				50	ms	
Laser enable (turn on) time				50	ms	To >90% power
Laser disable (turn off) time				10	$\mu$ s	To <10% power
Module initialization time				20	s	
<b>Receiver</b>						
Data rate		9.95		11.35	Gb/s	NRZ
Input operating wavelength	$\lambda$	1525		1575	nm	
Receiver Sensitivity			-26		dBm	10.709 Gb/s, IE-12, OSNR>35dB, optimized RxDTV
Maximum input power (overload)	P <sub>in MAX</sub>	-5			dBm	
LOS assert	PA	-33		-28.5	dBm	
LOS de-assert	PD	-32.5		-26.5	dBm	
LOS Hysteresis	PD - PA	0.5		4	dB	
LOS assert time	T <sub>A</sub>			100	$\mu$ s	
LOS de-assert time	T <sub>D</sub>			100	$\mu$ s	

## Pin Descriptions

Pin	Logic	Symbol	Name/Descriptions	Notes
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply	
3	LVTTTL-I	Mod-Desel	Module De-select, when held low allows the module to respond to 2-wire serial interface commands	
4	LVTTTL-O	Interrupt	Interrupt; Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		VCC5	+5V Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTTL-I/O	SCL	2-wire Serial interface clock	2
11	LVTTTL-I/O	SDA	2-wire Serial interface data line	2
12	LVTTTL-O	Mod_Abs	Indicates Module is not present. Grounded in the Module	2
13	LVTTTL-O	Mod_NR	Module Not Ready; Indicating Module Operational Fault	2
14	LVTTTL-O	RX_LOS	Receiver Loss Of Signal Indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver Inverted Data Output	
18	CML-O	RD+	Receiver Non-Inverted Data Output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply	3
21	LVTTTL-I	P_Down/RST	Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode. Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle	
22		VCC2	+1.8V Power Supply	3
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Not required	
25	PECL-I	RefCLK-	Not required	
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter Inverted Data Input	
29	CML-I	TD+	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1

**Notes:**

1. Module ground pins (GND) are isolated from the module case and chassis ground within the module.
2. Shall be pulled up with 4.7K-10kOhms to a voltage between 3.15V and 3.45V on the host board.
3. Variable Power Supply (VPS) function is not supported.









**About Us:**

Proline Options is one of North America's leading providers of transceivers and high speed cabling. With a reputation for quality, tested products that cover the connectivity spectrum, Proline Options has a solution for you regardless of the specification.

At Proline Options, every product is tested in its intended application - never batch or spec tested only. We run bandwidth, distance and IOS network tests. We have documented an impressive 0.03% failure rate over the last 10 years. To continue this rate of success we invest millions annually in our own on-site testing lab.



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