180-3370-900-AO

Ciena® 180-3370-900 Compatible TAA 400GBase-ZR+ QSFP-DD Transceiver (SMF, Coherent, LC, DOM, Open ZR +)

Features

- Source Full Spectrum 400ZR Coherent 60GBaud DP-16QAM Design
- High Tx launching power of over 0dBm Integrated Erbium Doped Fiber Amplifier (EDFA) and Tunable Optical Filter (TOF)
- Supports Dual Data Rates: 4x100GbE & 400GbE
- CMIS Rev. 5.0 and OIF C-CMIS 1.1
- Operating Temperature Range: 0 to 75 Celsius
- Support Data Center Interconnect for amplified link from 120km up to 1000km. Proprietary SFEC with PSC-16QAM available full C-Band tunable.
- RoHS Compliant and Lead-Free
- Power Consumption: 18.8W

Applications

- 400GBase Ethernet
- Access and Enterprise

Product Description

This Ciena® 180-3370-900 compatible QSFP-DD transceiver provides 400GBase-ZR Open ZR+ throughput over Single-mode fiber (SMF) using a coherent wavelength and using an LC connector. It is built to MSA standards and is uniquely serialized and data-traffic and application tested to ensure that they will integrate into your network seamlessly. 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.

AddOn'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.")

TAA COMPLIANT

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		75	°C	
Control Input Voltage	Vcc	-0.3		3.6	V	
Relative Humidity (Non-Condensing)	RH	5		95	%	
Operating Humidity (Non-Condensing)		5		85	%	
Signaling Rate Per Lane	DRL		59.84375		GBd	16QAM
Operating Distance		80		120	km	

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.135	3.3	3.465	V	
Instantaneous Peak Current at Hot Plug		I_{CC_IP}			4000	mA	
Sustained Peak Current at Hot Plug		I_{CC_SP}			3300	mA	
Maximum Power Dissipation 400GbE-ZR		PD		16.1	18.8	W	1,2
Maximum Power Dissipation (Low-Power Mode)		PD_{LP}			3.5	W	
2-Wire Serial Interface Clock Rate				400	1000	kHz	
ESD Rating	**High-Speed Pins**		-250		250	V	3
	All Other Pins		-500		500		
Tx Input Power Damage Threshold			14			dBm	
Rx Input Damage Threshold			14			dBm	4
Power Supply Noise Tolerance (10Hz-10MHz)					66	mV	
Rx Differential Data Output Load				100		Ω	
Electrical Low-Speed Control and Sense Signal Specifications							
SCL and SDA		VOL	0		0.4	V	5
SCL and SDA		VIL	-0.3		Vcc*0.3	V	
		VIH	Vcc*0.7		Vcc+0.5	V	
Capacitance for SCL and SDA IO Signal		Ci			14	pF	
Total Bus Capacitive Load for SCL and SDA		CB			100	pF	6
					200	pF	7
LPMode, ResetL, and ModSelL		VIL	-0.3		0.8	V	
		VIH	2		Vcc+0.3	V	
LPMode, ResetL, and ModSelL		|Iin|			360	uA	8
IntL		VOL	0		0.4	V	9
		VOH	Vcc-0.5		Vcc+0.3	V	10
ModPrsL		VOL	0		0.4	V	11
		VOH					

Notes:

1. 400GE client traffic. Typical power represents the highest power at 45°C case. Maximum power represents the highest power at 75°C case.
2. 4x100GE client mode increases power by 0.5W.
3. Human Body Model.
4. Instantaneous balanced dual polarization signal.
5. IOL(maximum)= 3mA for fast-mode, 20mA for fast-mode plus.
6. For 400kHz clock rate, use 3kΩ pull-up resistor.
7. For 400kHz clock rate, use 1.6kΩ pull-up resistor.
8. 0V<VIN<Vcc.
9. IOL=2.0mA.
10. 10kΩ pull-up to Host_Vcc.
11. IOL=2.0mA. Shortened to ground in module.

Optical Power Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Tx Provisional Output Power Range		-7		4	dBm	
Tx Emitted Total Output Power when Provisioned to Maximum		3			dBm	
Tx Provisional Output Power Step Size			0.1		dB	
Tx Total Output Power Monitor Accuracy		-1.0		1.0	dB	1
Output Power Stability		-0.5		0.5	dB	2
Output Power Enable Time				4	s	3
Output Power During Blanking				-20	dBm	
Output Power Disable Time				100	ms	4
Tx Optical Return Loss		20			dB	
Tolerable Optical Reflection				-27	dB	
Receiver						
Rx Operating Input Power Range		-6 12		5 -6	dBm	5 6
Rx Input Power Monitor Range		-22		5		
Rx Total Input Power Monitor Accuracy		-2.0		2.0		
Rx Signal Power Monitor Accuracy		-3.0		3.0		
Rx Input Power Transient Tolerance		-4.0		4.0		7
Rx Optical Return Loss		-22				8
Rx LOS Threshold			-18			9
Rx LOS Hysteresis		1.0				

Notes:

1. Output power monitor accuracy and output power tuning accuracy are equivalent.

2. Stability is defined as variation over time at a fixed temperature and wavelength.
3. Time to reach 90% of steady-state optical power upon de-assertion of Tx disable.
4. Time to reach output power during blanking upon assertion of Tx disable.
5. <0.5dB ROSNR penalty.
6. <1.5dB ROSNR penalty.
7. At 100us 10%-90% maximum slew rate, and operation within Rx operating input power range. ROSNR penalty <0.5dB/12.5GHz.
8. 400ZR complaint input signal.
9. Bases on Rx signal power monitor.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Tx Provisional Carrier Frequency Range		191.25		196.125	THz	1
Carrier Frequency Fine-Tuning Range		-5		5	GHz	
Carrier Frequency Fine-Tuning Step Size		100		100	MHz	
Carrier Frequency Error		-1.5		1.5	GHz	EOL
Local/In-band OSNR		40			dB/12.5GHz	
Global/Out-Band OSNR		40			dB/12.5GHz	
Symbol Rate 400G-E-ZR			59.8438		GBd	
Modulated Spectral Width 400G-E-ZR			66.37		GHz	-20dB Width
Tx Spectral Shaping 400G-E-ZR			0.125		RRC	Fixed
Laser Linewidth				500	kHz	
Tx X-Y Skew				5	ps	
Tx DC I-Q Offset				-26	dB	
Tx I-Q Instantaneous Offset				-20	dB	
Tx I-Q Amplitude Imbalance				1	dB	
Tx I-Q Phase Error		-5		5	°	
Tx I-Q Skew				0.75	Ps	
Tx X-Y Power Imbalance				1.5	dB	
Receiver						
ROSNR 400G-E-ZR				23.7 26.0	dB/12.5GHz	2 3
Rx Sensitivity 400G-E-ZR				-14	dBm	4
PMD Tolerance (Mean) 400G-E-ZR				10	ps	
SOP Tracking Tolerance 400G-E-ZR				50	krad/s	5
PDL Tolerance (Peak) 400G-E-ZR				3.5	dB	6
CD Tolerance 400G-E-ZR		-2.4		2.4	ns/nm	5

Notes:

1. All grids specified in CMIS are supported.
2. ROSNR test conditions as follows unless stated otherwise:
    - Back-to-back, single wavelength present.
    - No dispersion.
    - Rx Signal Power ≥ -6dBm.
    - Tx power provisioned to -12dBm.
    - No PDL other than the module itself.
    - PMD/DGD ≤ 2ps mean.
    - ≤5krad/s rate of change of SOP.
    - ROSNT is defined to be constant across all frequency channels. At different wavelengths, ROSNR is defined by:

        OSNR_linear-per_0.1nm(λ) = OSNR_linear_per_12.5GHz x $(\lambda_0/\lambda nm)^2$

        Where λ_0 = sqrt (c/12.5GHz) = 1548.65735nm.

        Noise bandwidth of 0.1nm = 12.5GHz at 1548.65735nm.
3. Same as note 1, except the Rx input power is >-12dBm and Tx power is provisioned to 10dBm.
4. Error free performance @OSNR>35dB/12.5GHz.
5. <0.5dB ROSNR penalty.
6. <1.3dB ROSNR penalty.

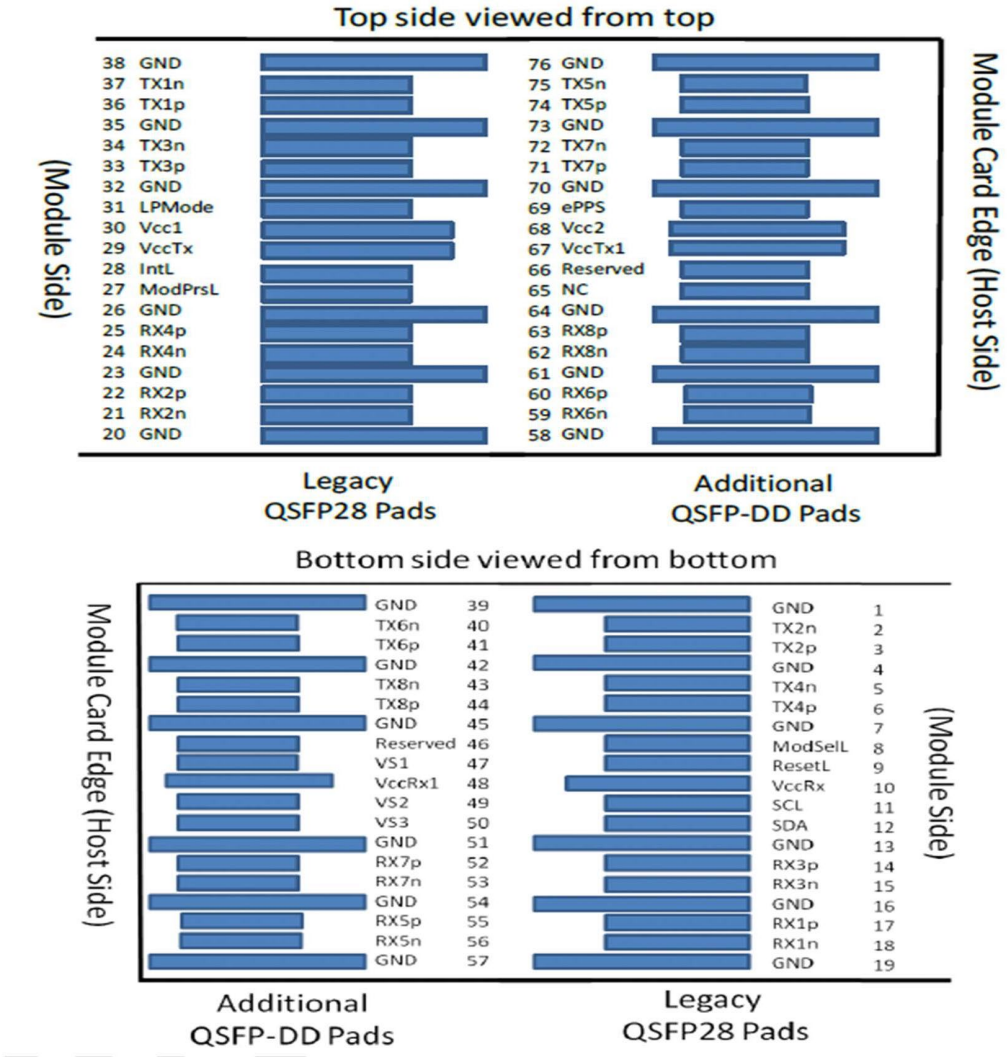
Pin Descriptions

Pin	Symbol	Logic	Name/Description	Notes
1	GND		Module Ground.	
2	Tx2-	CML	Transmitter Inverted Data Input.	
3	Tx2+	CML	Transmitter Non-Inverted Data Input.	
4	GND		Module Ground.	
5	Tx4-	CML	Transmitter Inverted Data Input.	
6	Tx4+	CML	Transmitter Non-Inverted Data Input.	
7	GND		Module Ground.	
8	ModSelL	LVTTL	Module Select Low	
9	ResetL	LVTTL	Module Select Low.	
10	VccRx		+3.3V Receiver Power Supply.	
11	SCL	LVCMOS	2-Wire Serial Interface Clock.	
12	SDA	LVCMOS	2-Wire Serial Interface Data.	
13	GND		Module Ground.	
14	Rx3+	CML	Receiver Non-Inverted Data Output.	
15	Rx3-	CML	Receiver Inverted Data Output.	
16	GND		Module Ground.	
17	Rx1+	CML	Receiver Non-Inverted Data Output.	
18	Rx1-	CML	Receiver Inverted Data Output.	
19	GND		Module Ground.	
20	GND		Module Ground.	
21	Rx2-	CML	Receiver Inverted Data Output.	
22	Rx2+	CML	Receiver Non-Inverted Data Output.	
23	GND		Module Ground.	
24	Rx4-	CML	Receiver Inverted Data Output.	
25	Rx4+	CML	Receiver Non-Inverted Data Output.	

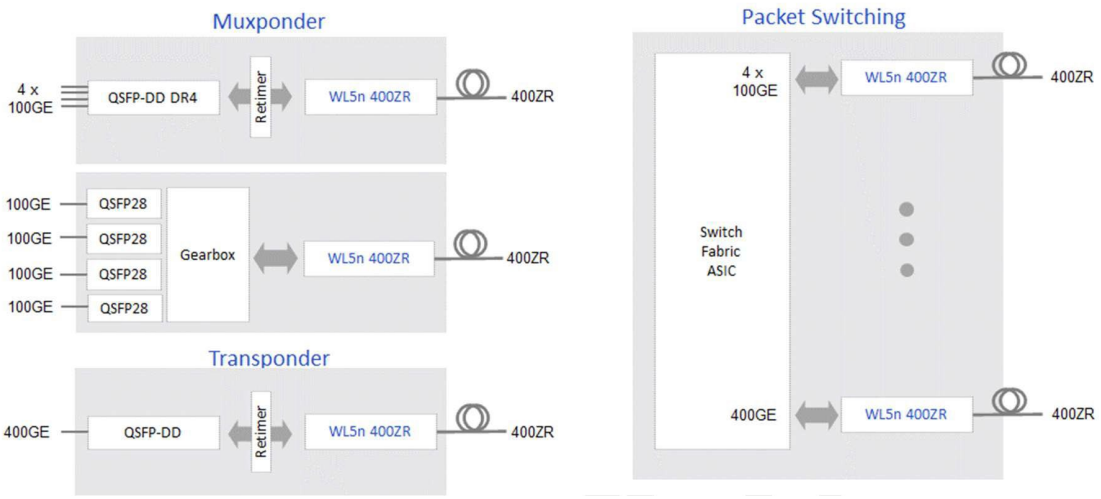
26	GND		Module Ground.	
27	ModPrsL	LVTTL	Module Present.	
28	IntL	LVTTL	Interrupt.	
29	VccTx		+3.3V Transmitter Power Supply.	
30	Vcc1		+3.3V Power Supply.	
31	LPMode	LVTTL	Low-Power Mode.	
32	GND		Module Ground.	
33	Tx3+	CML	Transmitter Non-Inverted Data Input.	
34	Tx3-	CML	Transmitter Inverted Data Input.	
35	GND		Module Ground.	
36	Tx1+	CML	Transmitter Non-Inverted Data Input.	
37	Tx1-	CML	Transmitter Inverted Data Input.	
38	GND		Module Ground.	
39	GND		Module Ground.	
40	Tx6-	CML	Transmitter Inverted Data Input.	
41	Tx6+	CML	Transmitter Non-Inverted Data Input.	
42	GND		Module Ground.	
43	Tx8-	CML	Transmitter Inverted Data Input.	
44	Tx8+	CML	Transmitter Non-Inverted Data Input.	
45	GND		Module Ground.	
46	Reserved		For Future Use.	
47	VS1		Module Vendor-Specific 1.	
48	VccRx1		+3.3V Receiver Power Supply Receiver.	
49	VS2		Module Vendor-Specific 2.	
50	VS3		Module Vendor-Specific 3.	
51	GND		Module Ground.	
52	Rx7+	CML	Receiver Non-Inverted Data Output.	
53	Rx7-	CML	Receiver Inverted Data Output.	
54	GND		Module Ground.	
55	Rx5+	CML	Receiver Non-Inverted Data Output.	
56	Rx5-	CML	Receiver Inverted Data Output.	
57	GND		Module Ground.	
58	GND		Module Ground.	
59	Rx6-	CML	Receiver Inverted Data Output.	
60	Rx6+	CML	Receiver Non-Inverted Data Output.	
61	GND		Module Ground.	
62	Rx8-	CML	Receiver Inverted Data Output.	
63	Rx8+	CML	Receiver Non-Inverted Data Output.	
64	GND		Module Ground.	
65	NC		Not Connected.	
66	Reserved		For Future Use.	
67	VccTx1		+3.3V Power Supply Transmitter.	
68	Vcc2		+3.3V Power Supply.	
69	Reserved		For Future Use.	
70	GND		Module Ground.	
71	Tx7+	CML	Transmitter Non-Inverted Data Input.	

72	Tx7-	CML	Transmitter Inverted Data Input.	
73	GND		Module Ground.	
74	Tx5+	CML	Transmitter Non-Inverted Data Input.	
75	Tx5-	CML	Transmitter Inverted Data Input.	
76	GND		Module Ground.	

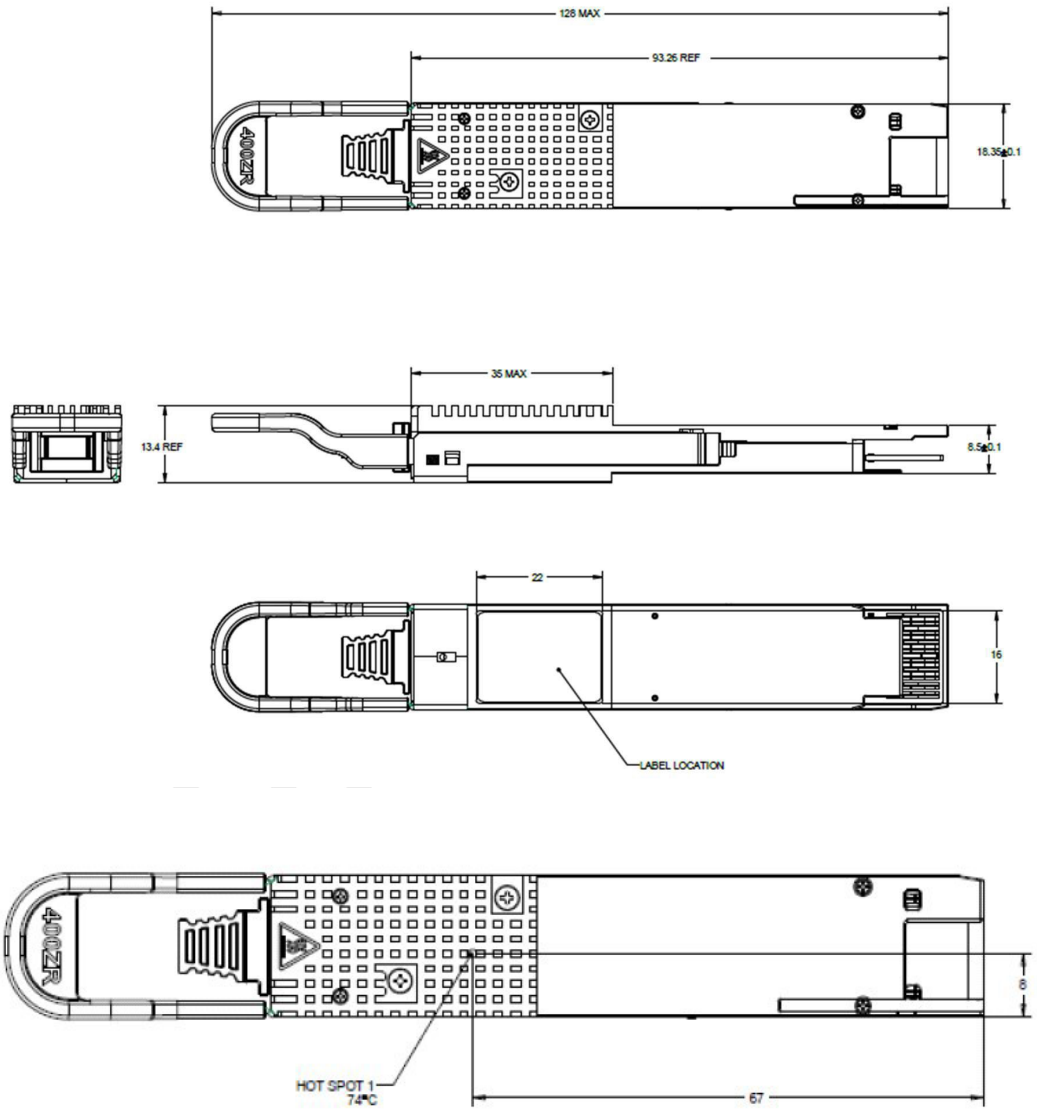
Electrical Pad Layout



Host Board Schematic



Mechanical Specifications



About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is in engrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.

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