

SFP-10GB-DW36-80-PA-C

Palo Alto Networks® Compatible 10GBase-DWDM 50GHz SFP+ Channel 36 Transceiver (SMF, 1548.52nm, 80km, LC, DOM)

Features:

- SFF-8432 and SFF-8472 Compliance
- Duplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



Applications:

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

Product Description

This Palo Alto Networks® compatible SFP+ transceiver provides 10GBase-DWDM throughput up to 80km over single-mode fiber (SMF) using a wavelength of 1548.51nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Palo Alto Networks® 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.

ProLabs' 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 SFP+ Channel Number and Wavelength

ITU Channel	Frequency (THz)	Center Wavelength (nm)	ITU Channel	Frequency (THz)	Center Wavelength (nm)
1	191.35	1566.72	49	193.75	1547.32
2	191.40	1566.31	50	193.80	1546.92
3	191.45	1565.90	51	193.85	1546.52
4	191.50	1565.50	52	193.90	1546.12
5	191.55	1565.09	53	193.95	1545.72
6	191.60	1564.68	54	194.00	1545.32
7	191.65	1564.27	55	194.05	1544.92
8	191.70	1563.86	56	194.10	1544.53
9	191.75	1563.45	57	194.15	1544.13
10	191.80	1563.05	58	194.20	1543.73
11	191.85	1562.64	59	194.25	1543.33
12	191.90	1562.23	60	194.30	1542.94
13	191.95	1561.83	61	194.35	1542.54
14	192.00	1561.42	62	194.40	1542.14
15	192.05	1561.01	63	194.45	1541.75
16	192.10	1560.61	64	194.50	1541.35
17	192.15	1560.20	65	194.55	1540.95
18	192.20	1559.79	66	194.60	1540.56
19	192.25	1559.39	67	194.65	1540.16
20	192.30	1558.98	68	194.70	1539.77
21	192.35	1558.58	69	194.75	1539.37
22	192.40	1558.17	70	194.80	1538.98
23	192.45	1557.77	71	194.85	1538.58
24	192.50	1557.36	72	194.90	1538.19
25	192.55	1556.96	73	194.95	1537.79
26	192.60	1556.56	74	195.00	1537.40
27	192.65	1556.15	75	195.05	1537.00
28	192.70	1555.75	76	195.10	1536.61
29	192.75	1555.34	77	195.15	1536.22
30	192.80	1554.94	78	195.20	1535.82
31	192.85	1554.54	79	195.25	1535.43
32	192.90	1554.13	80	195.30	1535.04
33	192.95	1553.73	81	195.35	1534.64
34	193.00	1553.33	82	195.40	1534.25
35	193.05	1552.93	83	195.45	1533.86
36	193.10	1552.52	84	195.50	1533.47
37	193.15	1552.12	85	195.55	1533.07

38	193.20	1551.72	86	195.60	1532.68
39	193.25	1551.32	87	195.65	1532.29
40	193.30	1550.92	88	195.70	1531.90
41	193.35	1550.52	89	195.75	1531.51
42	193.40	1550.12	90	195.80	1531.12
43	193.45	1549.72	91	195.85	1530.72
44	193.50	1549.32	92	195.90	1530.33
45	193.55	1548.91	93	195.95	1529.94
46	193.60	1548.52	94	196.00	1529.55
47	193.65	1548.11	95	196.05	1529.16
48	193.70	1547.72	96	196.10	1528.77

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5		4.0	V
Storage Temperature	TS	-40		85	°C
Operating Case Temperature	Tc	-40		85	°C
Relative Humidity	RH	5		95	%
Data Rate			10.3125		Gb/s

Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes	
Power Supply Voltage	Vcc	3.135	3.3	3.465	V		
Module Supply Current	Icc		300	550	mA		
Power Dissipation	P _D		1.0	1.8	W		
Transmitter							
Input Differential Impedance	Z _{in}		100		Ω		
Differential Data Input Swing	V _{IN, P-P}	180		700	mVp-p		
TX_FAULT	Transmitter Fault	V _{OH}	2.0		V _{CCHOST}	V	
	Normal Operation	V _{OL}	0		0.8	V	
TX_DISABLE	Transmitter Disable	V _{IH}	2.0		V _{CCHOST}	V	
	Transmitter Enable	V _{IL}	0		0.8	V	
Receiver							
Output differential impedance	Z _o		100		Ω		
Differential Data Output Swing	V _{OUT, P-P}	300		850	mVp-p	1	
Data Output Rise Time, Fall Time	t _r , t _f	28			ps	2	
RX_LOS	Loss of signal (LOS)	V _{OH}	2.0		V _{CCHOST}	V	3
	Normal Operation	V _{OL}	0		0.8	V	3

Notes:

1. Internally AC coupled, but requires an external 100Ω differential load termination.
2. 20-80%
3. LOS is an open collector output. Should be pulled up with 4.7Ω on the host board.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Launch Optical Power	P _o	0		5	dBm	1
Center Wavelength Range	λ _c	1528.77		1563.86	nm	
Center Wavelength Spacing			50		GHz	
Extinction Ratio	EX	9.0			dB	2
Side Mode Suppression Ratio	SMSR	30			dB	
Spectral Width (-20dB)				1	nm	
Transmitter and Dispersion Penalty	TDP			3.0	dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Optical Return Loss Tolerance	ORLT			21	dB	
Pout @TX-Disable Asserted	P _{off}			-30	dBm	1
Tx Power Monitor Accuracy				±3	dB	
Eye Diagram	IEEE Std 802.3-2005 10Gb Ethernet 10GBASE-ZR compatible					
Receiver						
Center Wavelength	λ _c	1528		1565	nm	
Receiver Sensitivity (P _{avg})	S			-23	dBm	3
Receiver overload (P _{avg})	P _{OL}	-8			dBm	3
Optical Return Loss	ORL			-27	dB	
Chromatic Dispersion	CD			1600	ps/nm	
OSNR		27			dB	4
Max OSNR Path Penalty				4	dB	4
Optical Power Path Penalty				3	dB	
Rx Power Monitor Accuracy				±3	dB	
Dispersion Limited Distance				80	km	
Attenuation Limited Distance				80	km	
LOS De-Assert	LOSD			-25	dBm	
LOS Assert	LOSA	-35			dBm	
LOS Hysteresis		0.5			dB	

Notes:

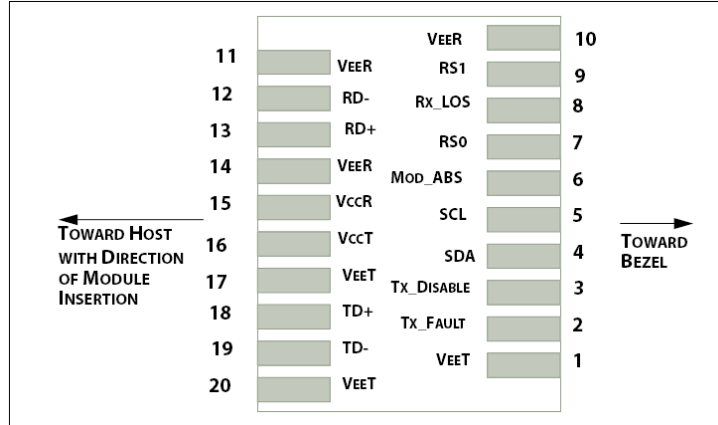
1. The optical power is launched into 9/125μm SMF.
2. Measured with a PRBS 2³¹-1 test pattern @10.3125Gbps.
3. Measured with PRBS 2³¹-1 test pattern, 10.3125Gb/s, BER<10⁻¹².
4. Receiver power @ -7 ~-18dBm, 10.3125Gb/s, BER<10⁻¹².

Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault (LVTTTL-O) - High indicates a fault condition	2
3	TX_Disable	Transmitter Disable (LVTTTL-I) – High or open disables the transmitter	3
4	SDA	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	4
5	SCL	Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)	4
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	5
7	RS0	Rate Select 0 – Not used, Presents high input impedance	
8	RX_LOS	Receiver Loss of Signal (LVTTTL-O)	2
9	RS1	Rate Select 1 – Not used, Presents high input impedance	
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O)	
13	RD+	Received Data out (CML-O)	
14	VeeR	Receiver Ground	
15	VccR	Receiver Power - +3.3V	
16	VccT	Transmitter Power - +3.3 V	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Data In (CML-I)	
19	TD-	Inverse Transmitter Data In (CML-I)	
20	VeeT	Transmitter Ground	1

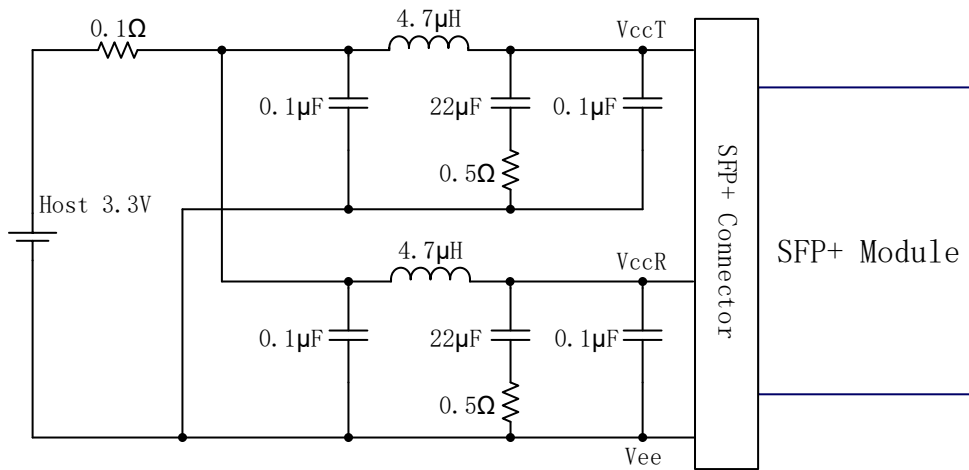
Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7K Ω to 10K Ω pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7K Ω to 10K Ω pull-up resistor to VccT.
4. Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that on the host board requires a 4.7K Ω to 10K Ω pull-up resistor to VccHost.

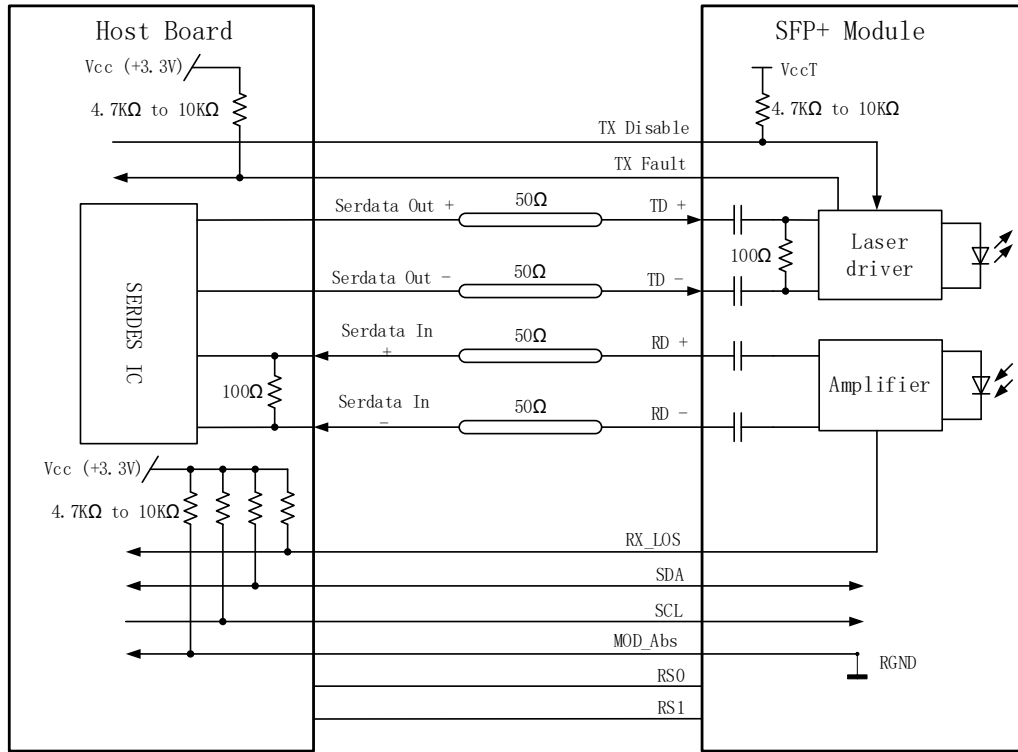


Pin-out of connector Block on Host board

Recommended Host Board Power Supply Filter Network

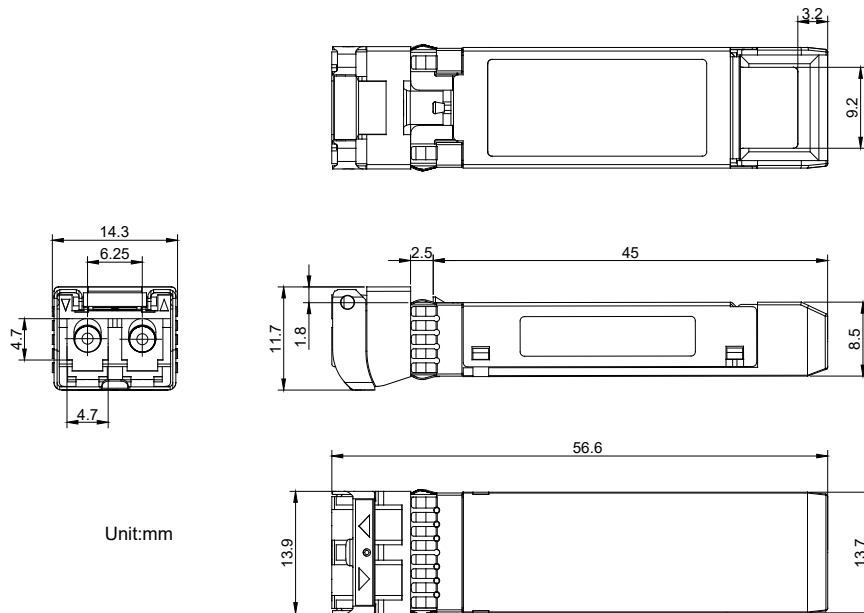


Recommend Application Interface Block Diagram



Mechanical Specifications

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



About ProLabs

Our extensive experience comes as standard. For over 20 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with more than 100 optical switching and transport platforms.

A Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 1.6T while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

The Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure compatible products, and immediate answers to your questions. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.



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