

TR1-M4-2023M

1X9 Dual Fiber
Fast Ethernet 100 Mb / s
1310 nm Tx / Rx

www.palconnusa.com

Description

The 1x9 SC duplex 1310nm O-E Transceivers can transmit digital data up to 2 km via Multi-mode optical fiber and the optical performances comply with the Fast Ethernet interface, 155Mbps ATM interface and FDDI PMD Standard.



Features

- Distance up to 2 km
- Industry Standard 1x9 Package Footprint
- Duplex SC Connector
- Single Power Supply +3.3 V
- LVPECL Differential Data Inputs and Outputs
- LVPECL Signal Detection Output
- DC/DC Inputs and Outputs

Applications

- ATM 155 Mbps Links
- SONET/SDH Equipment Interconnect
- Fast Ethernet 100 Mb/s Links
- Comply with Fast Ethernet, OC-3, STM-1 and FDDI Standards
- Class 1 Laser International Safety Standard IEC 825 Compliant

Laser Safety

This single mode transceiver is a Class 1 laser product. It complies with IEC 825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.



TR1-M4-2023M

1X9 Dual Fiber
Fast Ethernet 100 Mb / s
1310 nm Tx / Rx

www.palconnusa.com

Absolute maximum ratings

Parameter	Symbol	Min	Typ.	Max	Units
Storage Temperature	T_S	-40	85	°C	
Supply Voltage	V_{CC}	-	6	V	
Input Voltage	-	GND	V_{CC}	V	
Soldering Temperature	T_{SOLD}	-	260	°C	10s on leads

Recommended operating conditions

Parameter	Symbol	Min	Typ.	Max	Units
Ambient Operating Temperature	T_{AMB}	0	-	70	°C
Supply Voltage	V_{CC}	3.15	3.3	3.45	V
Data Rate	-	-	155	-	Mb/s



TR1-M4-2023M

1X9 Dual Fiber
Fast Ethernet 100 Mb / s
1310 nm Tx / Rx

www.palconnusa.com

Transmitter optical Specifications ($0^{\circ}\text{C} < T_{\text{opr}} < 70^{\circ}\text{C}$, $3.1\text{ V} < V_{\text{cc}} < 3.4\text{ V}$)

Parameter	Symbol	Min	Typ.	Max	Units	Note
Optical						
Output Optical Power	P _{out}	-20	-	-14	dBm	1
Extinction Ratio	ER	8.2	-	-	dB	
Output Eye	Compliant with Bellcore TR-NWT-000253 and ITU recommendation G.957					
Center Wavelength	λ_c	1260	1310	1360	nm	
Spectral Width(FWHM)	$\Delta\lambda$	-	-	200	nm	RMS(σ)
Rise/Fall Time	T _{rr} /T _f	0.6	-	3.0	ns	2
Total Jitter	T _j	-	-	1.2	ns	3
Deterministic Jitter	T _{DDJ}	-	-	0.6	ns	
Random Jitter	T _{RJ}	-	-	0.69	ns	
Electrical						
Power Supply Current	I _{cc}	-	-	160	mA	4
Differential Input Voltage	V _{IH} -V _{IL}	300	-	-	mV	5
Data Input Voltage-Low	V _{IL} - V _{cc}	-2.0	-	-1.58	V	
Data Input Voltage-High	V _{IH} - V _{cc}	-1.1	-	-0.74	V	

Notes:

1. Output power is coupled into a 62.5/125 μm Multi-mode fiber.
2. 10% to 90% Values. Maximum T_r, T_f times tested against eye mask.
3. Measured with a 2²³ -1 PRBS with 72 ones and 72 zeros.
4. Maximum current is specified at V_{cc} = Maximum @ maximum temperature.
5. These inputs are compatible with 10K, 10KH and 100K LVECL and LVPECL inputs.



TR1-M4-2023M

1X9 Dual Fiber
Fast Ethernet 100 Mb / s
1310 nm Tx / Rx

www.palconnusa.com

Receiver optical Specifications (0 °C < T_{opr} < 70 °C, 3.1 V < V_{cc} < 3.4 V)

Parameter	Symbol	Min	Typ.	Max	Units	Note
Sensitivity	P _{IN}	-	-34	-32	dBm	1
Maximum Input Power	P _{IN}	-3	-	-	dBm	
Center Wavelength	λ _C	1270	1310	1360	nm	
Signal Detect-Asserted	P _A	-	-	-32	dBm	Average
Signal Detect-Deasserted	P _D	-45	-	-	dBm	Average
Signal Detect-Hysteresis	P _A -P _D	-	3.0	-	dB	
Wavelength of Operation		1100	-	1600	nm	
Electrical						
Power Supply Current	I _{CC}	-	-	100	mA	2
Data Output Voltage-Low	V _{OL} - V _{CC}	-2.0	-	-1.58	V	3
Data Output Voltage-High	V _{OH} - V _{CC}	-1.1	-	-0.74	V	
Signal Detect Voltage-Low	V _{OL} -V _{CC}	-2.0	-	-1.58	V	
Signal Detect Voltage-High	V _{OH} -V _{CC}	-1.1	-	-0.74	V	

Notes:

1. Minimum sensitivity and saturation levels at BER=1E-10 for a 2²³ -1 PRBS with 72 ones and 72 zeros.
2. The current excludes the output load current.
3. These outputs are compatible with 10K, 10KH and 100K LVECL and LVPECL outputs.

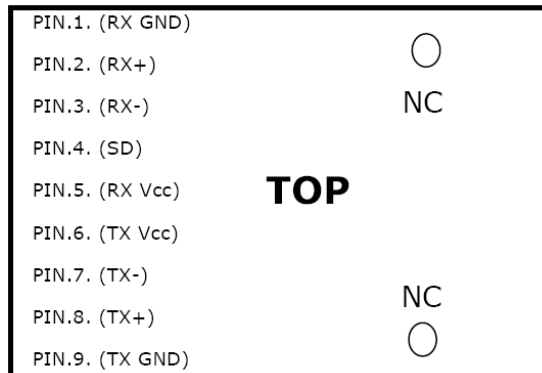
TR1-M4-2023M

1X9 Dual Fiber
Fast Ethernet 100 Mb / s
1310 nm Tx / Rx

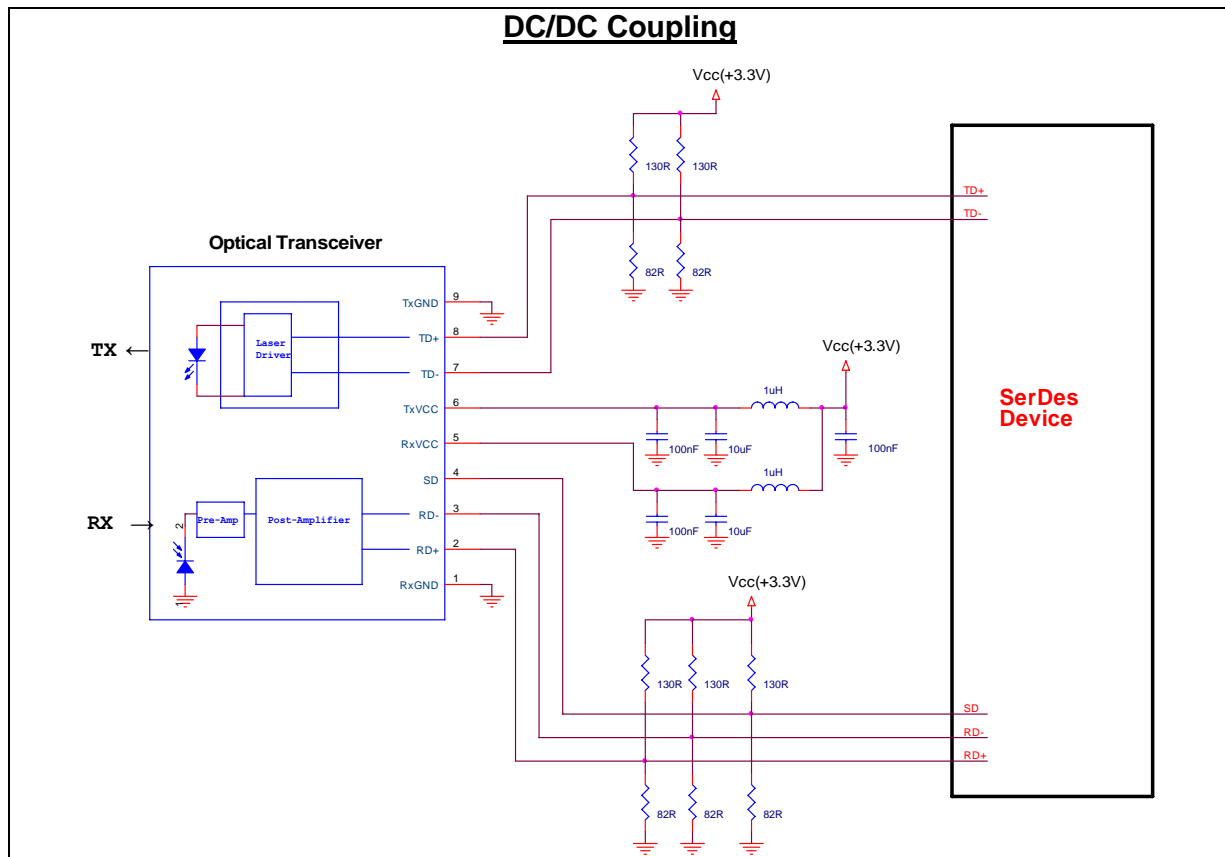
www.palconnusa.com

Connection Diagram

1. Receiver Signal Ground
2. Receiver Data Out
3. Receiver Data Out Bar
4. Signal Detect
5. Receiver Power Supply
6. Transmitter Power Supply
7. Transmitter Data In Bar
8. Transmitter Data In
9. Transmitter Signal Ground



Recommended Application Circuit



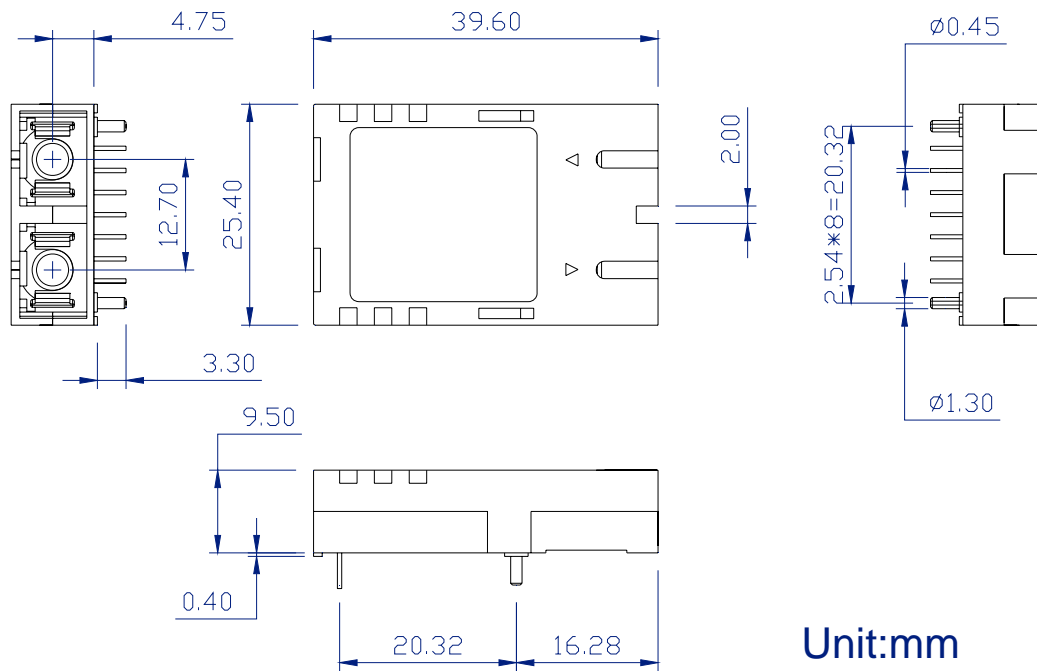


TR1-M4-2023M

1X9 Dual Fiber
Fast Ethernet 100 Mb / s
1310 nm Tx / Rx

www.palconnusa.com

Dimensions in mm



Unit:mm