

1X9 Single Mode Fiber DUAL Transceiver

2500Mbps 60Km

RTR1-5D48-3***

Product Features

- 1550nm DFB Laser Transmitter
- InGaAs PIN-TIA Photodiode Receiver
- Reach 60km Transmission Distance on 9/125μm SMF
- DUAL Single Mode Transceiver 1x9 Footprint
- SC, FC or ST Optical Interface are Optional
- Single +3.3V Power Supply
- LVPECL Differential Inputs and Outputs
- LVTTTL Signal Detection Output
- Compliant With RoHS and Lead Free
- Metal Enclosure for Lower EMI
- Operating Case Temperature:
 - Standard: 0 to +70°C
 - Extend: -20 to +75°C
 - Industrial: -40 to +85°C

Product Applications

- High Speed Links For Ethernet
- ATM/SONET/SDH
- Switch/Router
- Other Optical Transmission Systems

Performance Specifications

➤ Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	
Storage Temperature	Tst	-40	+85	°C	
Operating Temperature	To	RTR1-5D48-3C**	0	+70	°C
		RTR1-5D48-3E**	-20	+75	°C
		RTR1-5D48-3I**	-40	+85	°C
Input Voltage	-	GND	V _{CC}	V	
Power Supply Voltage	V _{CC} -V _{EE}	0	+3.6	V	

Note: Stress in excess of maximum absolute ratings can cause permanent damage to the module

➤ Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	
Storage Temperature	Tst	-40	-	+85	°C	
Operating Case Temperature	Tc	RTR1-5D48-3C**	0	-	+70	°C
		RTR1-5D48-3E**	-20	-	+75	°C
		RTR1-5D48-3I**	-40	-	+85	°C
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V	
Power Supply Current	I _{CC}	-	-	300	mA	
Data Rate	DR	-	2500	-	Mbps	

➤ Optical Specification

Transmitter							
Parameter	Symbol	Min	Typ	Max	Unit	Note	
Center Wavelength	1550 DFB	λ_c	1530	1550	1570	nm	-
Spectral Width	DFB	$\Delta\lambda$	-	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dB	DFB Laser	
Average Optical Output Power	P _o	-2	-	3	dBm	-	
Extinction Ratio	ER	8.2	-	-	dB	-	
Optical Rise/Fall Time(20%-80%)	Tr/Tf	-	-	0.18	ns	-	
Output Eye Diagram	Compliant with ITU-T G.957						
Receiver							
Parameter	Symbol	Min	Typ	Max	Unit	Note	
Operate Wavelength	-	1260	-	1620	nm	-	
Receiver Sensitivity	R _{SENS}	-	-	-19	dBm	1	
Receiver Saturation	P _{RS}	-3	-	-	dBm	1	
SD Assert	-	-35	-	-	dBm	Alarm: High-level	
SD De-Assert	-	-	-	-19	dBm		
SD Hysteresis	-	0.5	-	5	dBm	-	

Note: 1. Minimum Sensitivity and saturation levels for a 2²³-1 PRBS test pattern @2500Mbps.

Electrical Specification

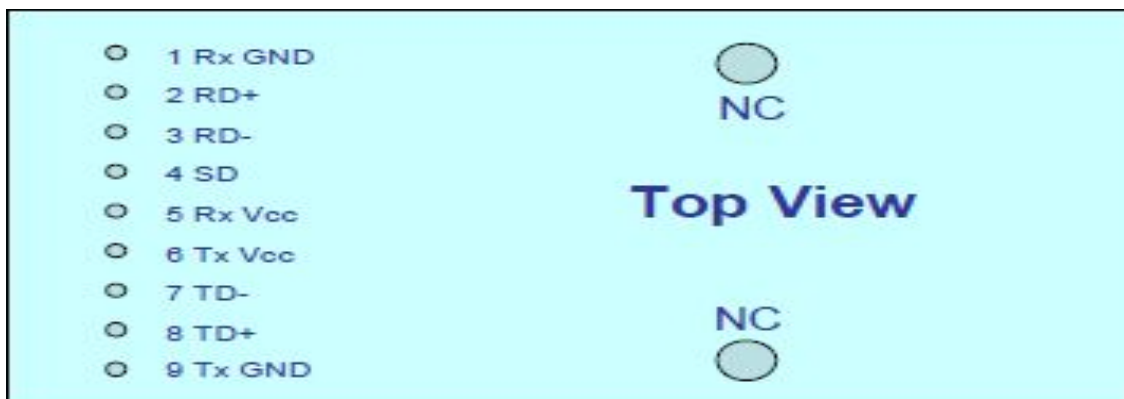
Transmitter						
Parameter	Symbol	Min	Typ	Max	Unit	Note
Power Supply Current	I_{CC}	-	70	180	mA	2
Input Differential Impedance	Z_{IN}	90	100	110	Ω	-
Single-terminal Input Voltage	$V_{IH} - V_{IL}$	300	-	1000	mV	-
Data Input Voltage-Low	$V_{IL} - V_{CC}$	-1.81		-1.48	V	-
Data Input Voltage-High	$V_{IH} - V_{CC}$	-1.16		-0.88	V	-
Receiver						
Parameter	Symbol	Min	Typ	Max	Unit	Note
Power Supply Current	I_{CC}	-	70	150	mA	2
Data Output Voltage-Low	$V_{OL} - V_{CC}$	-1.81	-	-1.62	V	3
Data Output Voltage-High	$V_{OH} - V_{CC}$	-1.025	-	-0.88	V	3
Signal Detect Output Voltage-Low	$V_{SDL} - V_{CC}$	-	-	0.8	V	TTL/LVTTL
Signal Detect Output Voltage-High	$V_{SDH} - V_{CC}$	2.0	-	-	V	

Note: 2. The current excludes the output load current.

3. Terminated with 500hm to Vcc-2V.

Pin Definitions

PIN Diagram

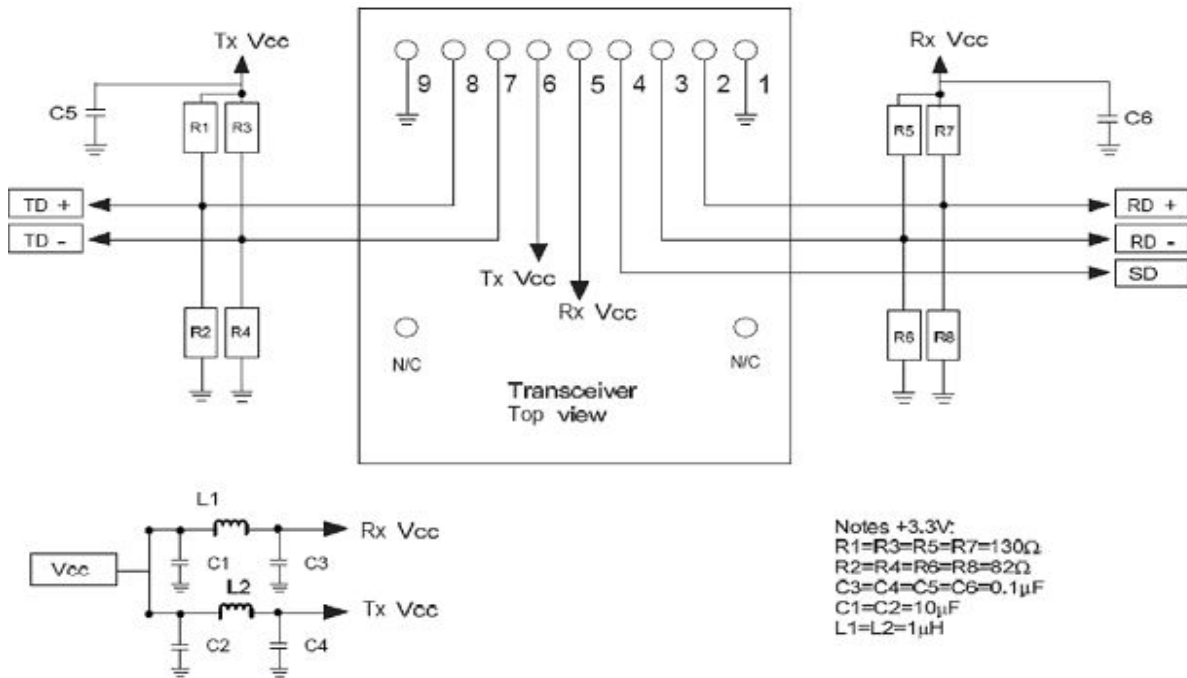


PIN Description

PIN	Symbol	Note
1	GNDR	Directly connect this pin to receiver signal ground plane.
2	RD+	See recommended circuit schematic.
3	RD-	See recommended circuit schematic.
4	SD	Active high on this indicates a receiver optical signal.
5	VccR	+3.3V DC power for the receiver section.
6	VccT	+3.3V DC power for the transmitter section.
7	TD-	See recommended circuit schematic.
8	TD+	See recommended circuit schematic.
9	GNDT	Directly connect this pin to transmitter signal ground plane.

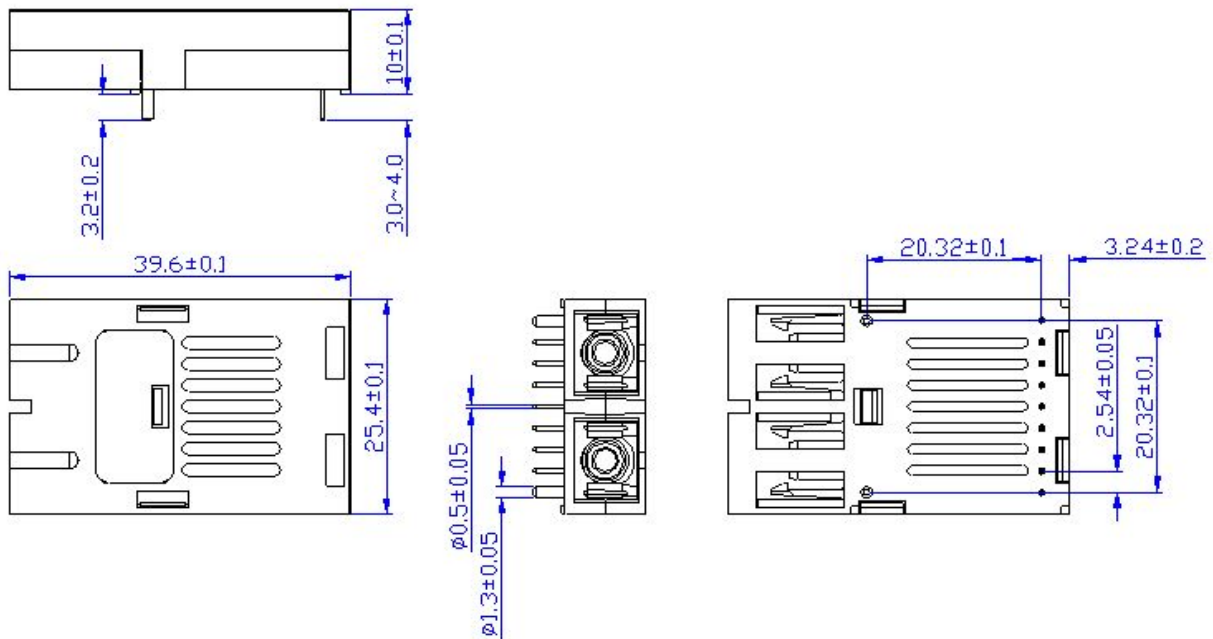
Recommended Circuit

▶ TTL Signal Detect



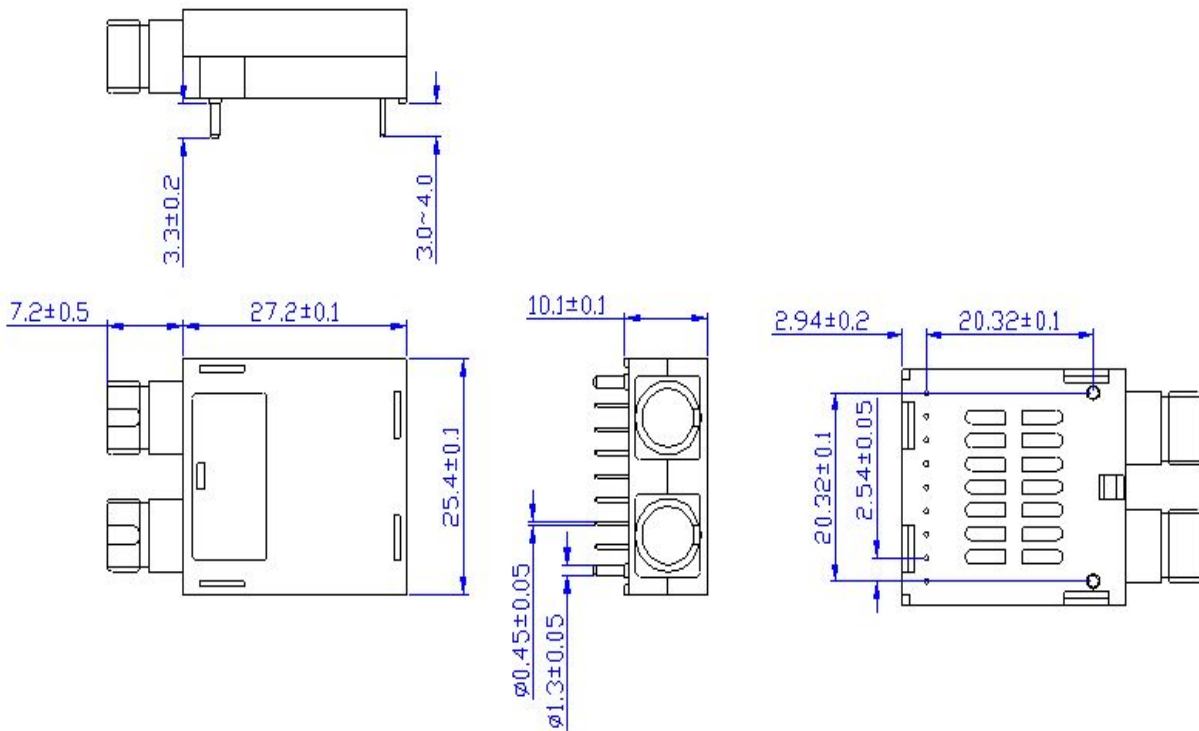
Package Diagram

▶ SC Interface



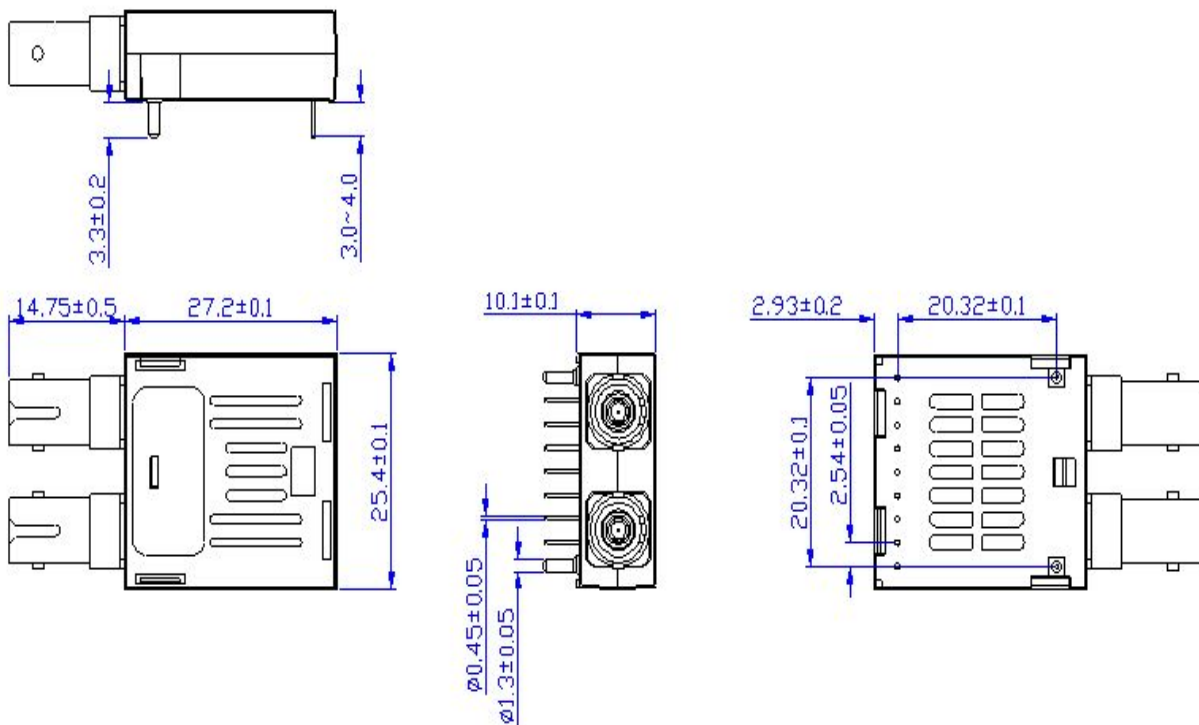
Unit: mm

➤ **FC Interface**



Unit: mm

➤ **ST Interface**



Unit: mm

Order Information

R	TR	1	-	5D	48	-	3	*	*	4	*	
REON	1X9	1=DUAL Fiber Inter- face	-	5D=1550nm DFB	48=2500 Mbps	-	-2~3 dBm	C E I	0~+70 °C -20~+75 °C -40~+85 °C	2=SC/PC 3=SC/APC 4= FC/PC 5=FC/APC 6=ST/PC 7=ST/APC	4=3.3V CML signal /TTL alarm	Customer Information

P/N	Package	Fiber Type	Data Rate (bps/Hz)	Reach	Tx(nm)	Rx	Temperature (°C)	Connector Type	Voltage
RTR1-5D48-3C24	1x9	SM	2.5G	60Km	1550 DFB	PIN	0~+70	SC	3.3V
RTR1-5D48-3I24	1x9	SM	2.5G	60Km	1550 DFB	PIN	-40~+85	SC	3.3V
RTR1-5D48-3C44	1x9	SM	2.5G	60Km	1550 DFB	PIN	0~+70	FC	3.3V
RTR1-5D48-3I44	1x9	SM	2.5G	60Km	1550 DFB	PIN	-40~+85	FC	3.3V
RTR1-5D48-3C64	1x9	SM	2.5G	60Km	1550 DFB	PIN	0~+70	ST	3.3V
RTR1-5D48-3I64	1x9	SM	2.5G	60Km	1550 DFB	PIN	-40~+85	ST	3.3V

For more information:

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