

10G 1310nm 10KM Dual-Fiber Industrial-Grade 10PIN Surface-Mount Miniaturized Optical Transceiver RS-10G10-31-10DI

Feature Description

- ◆ More compact structural design – module height only 12mm
- ◆ Surface-mount I/O pins optimized for high-speed signal integrity
- ◆ Full metal casing
- ◆ Military-grade temperature range with anti-vibration design
- ◆ Equipped with received data signal detection function
- ◆ Operates solely on +3.3V single power supply
- ◆ LC interface type
- ◆ Pin and mounting dimensions fully compatible with STRATOS products

Applications

- ◆ Various digital optical communication systems
- ◆ 10Gbase-SR
- ◆ Fiber Channel
- ◆ SONET/SDH
- ◆ Switches

Description

The RS-10G03-31-10DI dual-fiber bidirectional ultra-compact optical transceiver module integrates the transmitting and receiving components within a compact metal housing, significantly enhancing its electromagnetic interference resistance.

The optical transmitter section employs a high-power LD, with the transmit signal pins (TD+ and TD-) adhering to the CML interface standard.

The optical receiver section consists of a PIN photodiode, a preamplifier with transimpedance, and a limiting amplifier, with the receive signal pins (RD+ and RD-) also conforming to the CML interface standard.

The signal detection pin (SD) follows the standard LVTTTL interface level. The module can enter a power-saving mode via the transmit disable pin (TDIS).

The module's pin configuration and mounting dimensions are fully compatible with similar

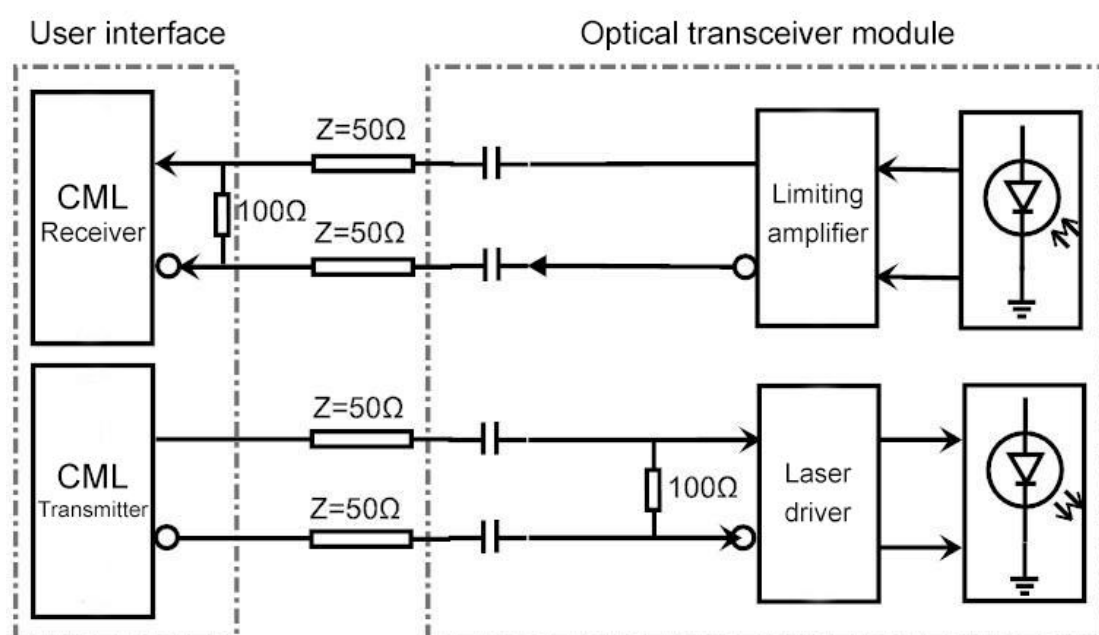


products from STRATOS. Functional pins, mounting, and form factors can be customized according to user requirements, ensuring flexible application.

Rigorous screening and environmental testing guarantee the module's reliability and adaptability, featuring resistance to vibration, electromagnetic interference, humidity, and extreme temperatures. It is widely suitable for medical, power, high-altitude, and other demanding environments.

With its compact size, lightweight, and all-metal construction, the module stands at a mere 12mm in height, facilitating easy installation in space-constrained boards or chassis.

Module Principle Block Diagram

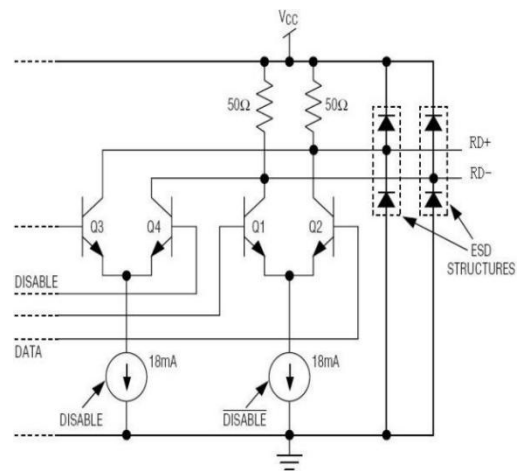
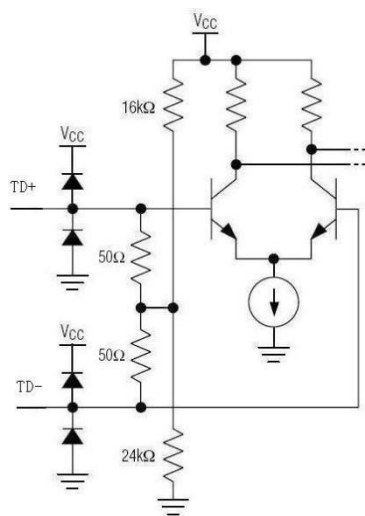


Module Parameter

Absolute Maximum Ratings					
Parameter	Symbol	minimum value	Typical value	maximal value	unit
Storage temperature	T_{STG}	-55	-	+85	°C
Soldering temperature	T_{SOLD}	-	-	+260	°C
Soldering time	t_{SOLD}	-	-	5	S
Power supply voltage	V_{CC}	+3	-	+3.6	V
Data input voltage	V_I	-0.5	-	V_{CC}	V
Differential input voltage (peak-to-peak)	V_D	-	-	2.0	V
Note: 1. The module cannot pass through the reflow soldering machine; 2. After pin soldering, cleaning cannot be done by spraying—only wiping is permitted.					

Recommended Working Conditions					
Parameter	Symbol	minimum value	Typical value	maximal value	unit
Working temperature	T_A	-40	-	+85	$^{\circ}\text{C}$
Power supply voltage	V_{CC}	-	+3.3	-	V
Transmit differential input voltage (peak-to-peak)	V_D	0.2	-	1	V
Send cutoff voltage	V_{TD}	2.0	-	-	V
Enable voltage transmission	V_{TEN}	-	-	0.8	V
Signal receiving terminal matching	R_L	-	50	-	Ohms

Data input/output port details



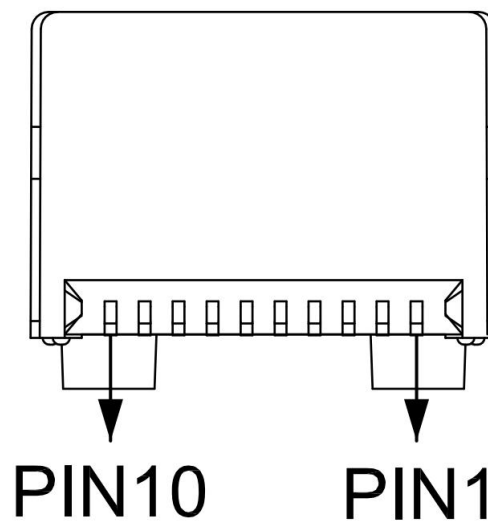
Module Performance

Transmission Section					
Test Conditions: $V_{CCTX}=3.3\text{V}$, $T_A=25^{\circ}\text{C}$, Test Module Rate=10.3125Gbps, PRBS2 ³¹ -1					
Parameter	Symbol	minimum value	Typical value	maximal value	unit
Data rate	Bitrate		10.3125Gbps	-	-
Output optical power	P_0	-5	-	+1	dBm
Output optical wavelength	λ_{OUT}	1300	1310	1320	nm
Extinction ratio	ER	3	5	-	dB
Input current	I_{CC}	-	120	160	mA
Rise/Fall Time of Optical Signal (20% to 80%)	t_{RF}	-	-	0.1	ns
Shake	T_j	-	-	80	ps
Send shutdown voltage	V_D	2.0	-	V_{CC}	V
Enable voltage transmission	V_{EN}	-	-	0.8	V

Reception section					
Test conditions: VCCRX=3.3V, TA=25°C, test module rate=10.3125Gbps, PRBS2 ³¹ -1					
Parameter	Symbol	minimum value	Typical value	maximal value	unit
Receiving sensitivity	S	-	-	-10	dBm
Shake	T _j	-	-	80	ps
Rise/Fall Time of Optical Signal (20% to 80%)	t _{R,F}	-	-	100	ps
Optical modulation amplitude	OMA	30	-	-	μW
Optical input wavelength range	λ _{IN}	1270	-	1355	nm
Optical return loss	ORL	12	-	-	dB
Input current	I _{CC}	-	70	120	mA
Signal detection arbitration time	t _{SDAS}	-	<10	50	μs
Signal detection timeout period	T _{SDDA}	-	<10	50	μs
Signal detection failure arbitration level	SD _{OFF}	-21	-	-	dBm
Signal detection arbitration level	SD _{ON}	-	-	-19	dBm
Signal detection lag	HYS	2	-	4	dB
Receive data output low level	V _{OL} -V _{CC}	-1.810	-	-1.475	V
Receive data output high level	V _{OH} -V _{CC}	-1.165	-	-0.880	V

Pin Definition

Side view



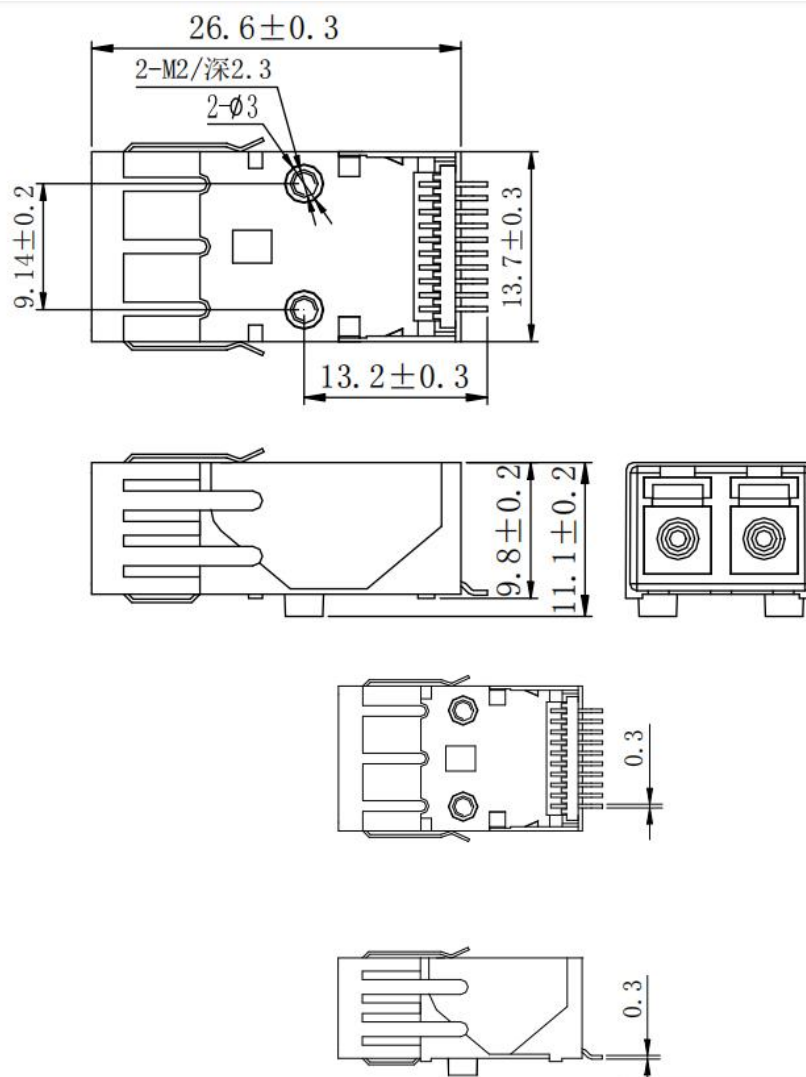
PIN	Symbol	Type	Description
1	TD+	CML, Input	Input data to the forward terminal
2	VEETX	Supply	Transmitter Ground
3	TD-	CML, Input	Reverse end input for sending data

4	VCCTX	Supply	Power source
5	LOS	LVTTL, Output	Signal loss output
6	TDIS ² (SCL) ²	LVTTL, Input	Send shutdown signal input
7	RD+	CML, Output	Positive terminal output of received data
8	SDA	LVTTL, I/O	IIC communication port
9	RD-	CML, Output	Reverse terminal output of received data
10	SCL	LVTTL, I/O	IIC communication port

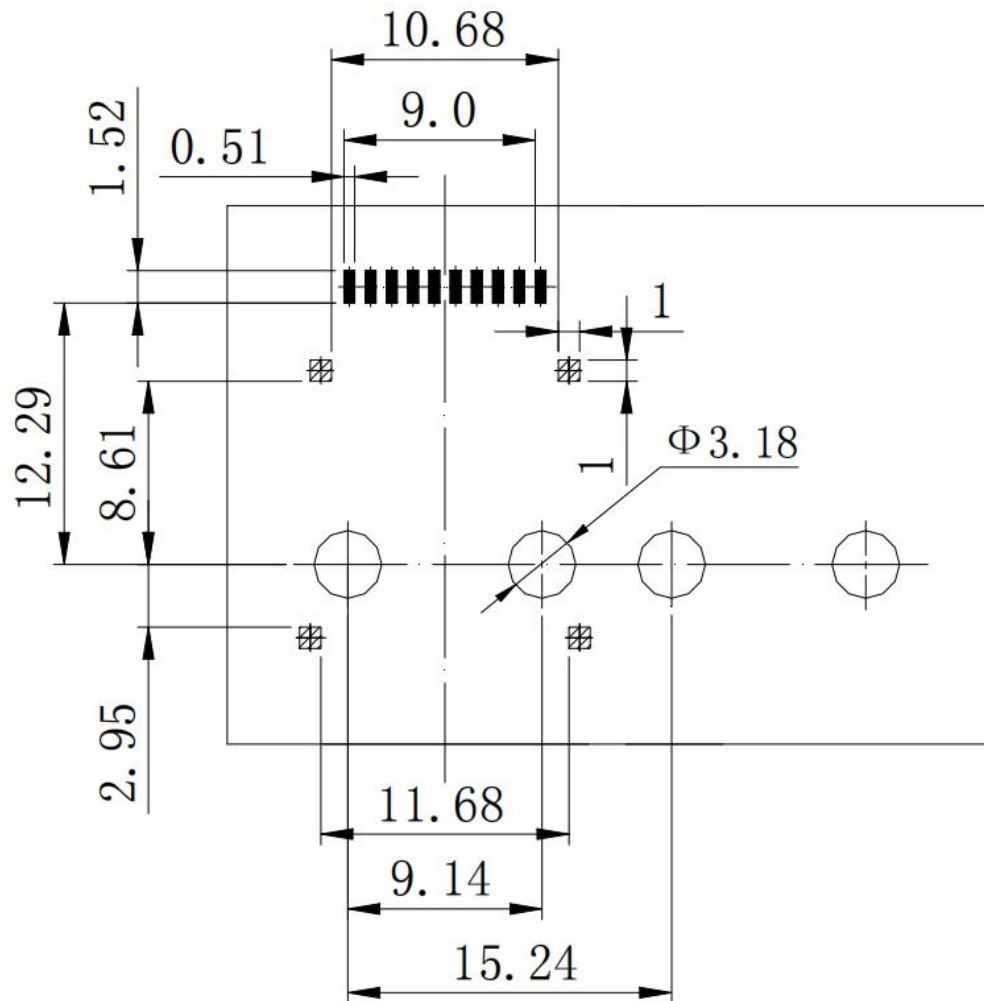
Note: 2. If the TX_DISABLE function is used, the TDIS pin should be pulled up to the power supply to maintain a high level on this pin; if the TX_DISABLE function is not used, the TDIS pin should be pulled down to ground to maintain a low level on this pin and must not be left floating, otherwise it may cause abnormal module operation.

3. For products with DDMI, pins 5 and 6 are SDA and SCL.

Dimension Drawing(mm)

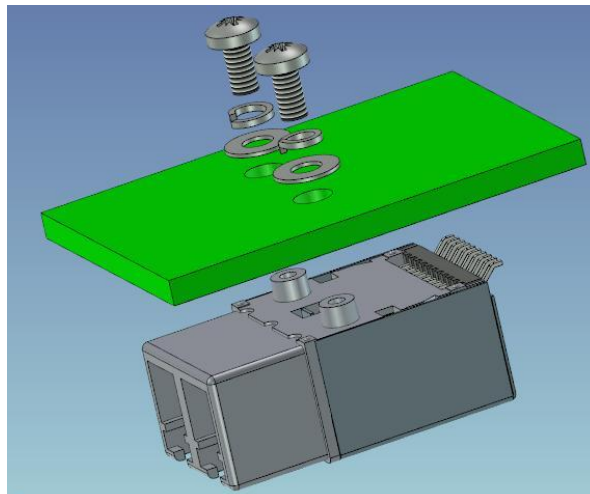


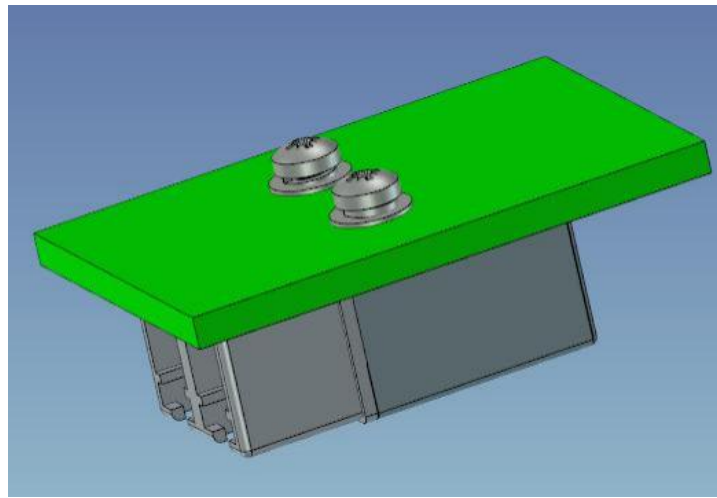
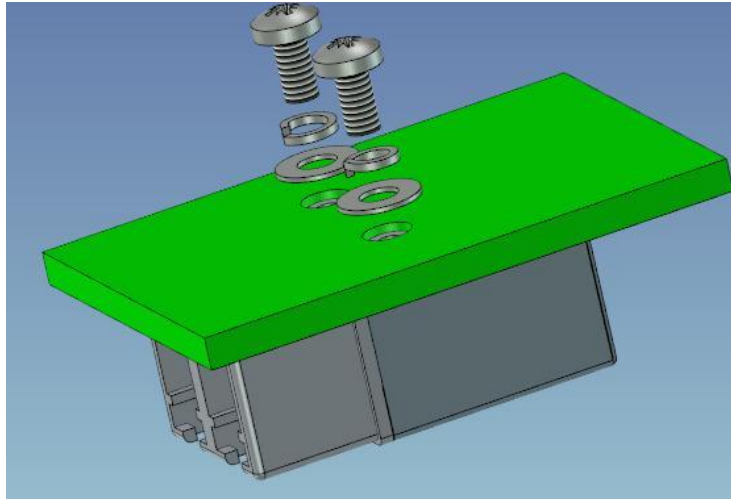
Module Installation Diagram (Top View) (mm)



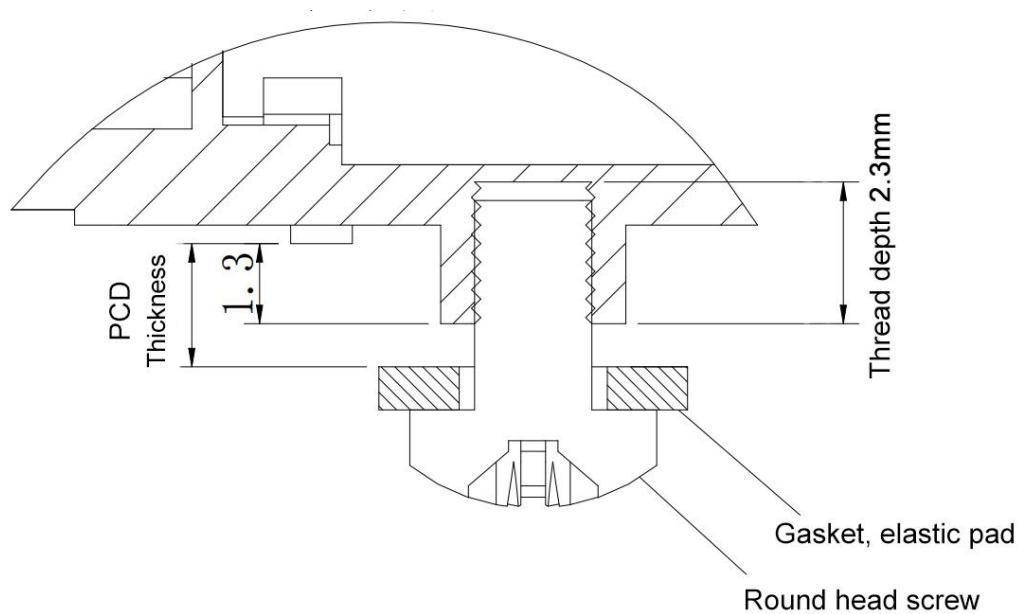
PCB Mounting Dimension Drawing (No wiring allowed in the hatched areas shown in the figure)

Module Installation Diagram





Module Installation Diagram



The specifications and quantities of screws, washers, and spring washers selected for module

installation can be found in the Module Screw Installation Table.

Example: If the PCB thickness is 2.0mm, then select 1 round head M2x4mm screw + 1 $\phi 2$ washer + 1 $\phi 2$ spring washer per mounting hole.

If the PCB thickness is 1.6mm, then select 1 round head M2x3mm screw + 1 $\phi 2$ washer + 1 $\phi 2$ spring washer per mounting hole.

Module Screw Installation Table							
No.	PCB board thickness	Screw		Washer		Spring washer	
		specifications	Qty	specifications	Qty	specifications	Qty
1	1.6	Round head M2×3mm	1	$\phi 2$	1	$\phi 2$	1
2	2.0	Round head M2×4mm	1	$\phi 2$	1	$\phi 2$	1
3	2.2	Round head M2×4mm	1	$\phi 2$	1	$\phi 2$	1
4	2.5	Round head M2×4mm	1	$\phi 2$	1	$\phi 2$	1

Ordering information

Part Number	Product Description
RS-10G10-31-10DI	Dual fiber 10G Single mode 1310nm 10km Industrial-grade 10Pin Mini Optical Transceiver Module