

Product Specification

SFP-WDM-SM- 0203*



1. Product Features

- Dual data-rate of 1.25Gbps/1.063Gbps operation
- 1550nm FP laser and PIN photo detector for 3km transmission
- 1310nm FP laser and PIN photo detector for 3km transmission
- BIDI SC/UPC type pluggable optical interface
- Class 1 safety certified
- Metal enclosure, for lower EMI
- Transmission with 9/125 μ m SMF
- Single 3.3V Power Supply and LVTTTL Logic
- Very low EMI and excellent ESD protection
- Operating case temperature
Standart temp: 0°C to +70°C
Industrial temp: -40°C to +85°C

2. Applications

- Switch to Switch Interface
- Gigabit Ethernet
- Switched Backplane Applications
- Router/Server Interface
- Other Optical Links

3. Product Description

RCI SFP-WDM-SM-0203* transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.0625Gbps and 3km transmission distance with SMF. The transceiver consists of three sections: a FP laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

4. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T _s	-40	85	°C
Operating Humidity	RH	5	85	%
Power Supply Voltage	V _{cc}	-0.5	+4.0	V

Notes:

[1] Stress in excess of the maximum absolute ratings can cause permanent damage to the module

5. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case temp	T _c	0 -40		70 85	°C
Power Supply Voltage	V _{cc}	3.14	3.3	3.46	V
Power Supply Current	I _{cc}			220	mA
Data Rate			1250		Mbps
Transmission Distance				3	KM

6. Specification of Transmitter

Parameter	Symbol	Min.	Typical	Max.	Unit
Average Output Power ^[1]	P _{out}	-14		-6	dBm
Extinction Ratio ^[1]	ER	9			dB
Mean Wavelength	SFP-WDM-SM-0203A	1270	1310	1350	nm
	SFP-WDM-SM-0203B	1530	1550	1570	nm
Spectral Width(RMS)	Δλ			4	nm
Rise/Fall Time (20%~80%) ^[2]	T _r / T _f			0,26	ps
Optical Eye Mask	Compliant with IEEE802.3 z (class 1 laser safety)				

Notes:

[1] Measure at 2²³-1 NRZ PRBS pattern

[2] Transmitter eye mask definition

7. Specification of Receiver

Parameter		Symbol	Min.	Typical	Max.	Unit
Sensitivity		P_{sens}			-20	dBm
Operating Wavelength	SFP-WDM-SM-0203A	λ	1530	1550	1570	nm
	SFP-WDM-SM-0203B		1270	1310	1350	nm
Min. Overload		R_{sens}	-3			dBm
LOS	LOS _A		-35			dBm
	LOS _D				-23	
LOS Hysteresis			0.5		6	dB

Notes:

- [1] Measured with Light source 1550nm(1310nm), ER=9dB; BER = 10^{-12} @ PRBS=2²³-1 NRZ.
- [2] When LOS de-asserted, the RX data+/- output is signal output.

8. Electrical Interface Characteristics

Parameter		Symbol	Min.	Typical	Max.	Unit
Differential Voltage Input Swing ^[1]		V_{in-p-p}	120		820	mV
Differential Voltage Output Swing ^[3]		$V_{out-p-p}$	340	650	850	mV
Differential input impedance		R_{IN}		100		Ω
Tx_Disable	Laser Disable	V_D	2.0		VCC+0.3	V
	Normal Operation	V_{EN}	0		0.8	V
Tx_Fault ^[2]	Transmitter Fault	V_{OH}	2.0		VCC+0.3	V
	Normal Operation	V_{OL}	0		0.8	V
Rx_LOS ^[2]	Los Signal	V_{OH}	2.0		VCC+0.3	V
	Normal Operation	V_{OL}	0		0.8	V

Notes:

- [1] TD+/- are internally AC coupled with 100 Ω differential termination inside the module.
- [2] Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10k Ω resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
- [3] RD+/- outputs are internally AC coupled, and should be terminated with 100 Ω (differential) at the user SERDES.

9 Pin Descriptions

Pin	Symbol	Name/Description	Plug Seq.
1	VeeT	Transmitter Ground (Common with Receiver Ground)	1
2	TX Fault	Transmitter Fault. Not supported. ^[1]	3
3	TX Disable	Transmitter Disable. Laser output disabled on high or open. ^[2]	3
4	MOD_DEF2	Module Definition 2. Data line for Serial ID. ^[3]	3
5	MOD_DEF1	Module Definition 1. Clock line for Serial ID. ^[3]	3
6	MOD_DEF0	Module Definition 0. Grounded within the module. ^[3]	3
7	Rate Select	No connection required ^[not available]	3
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation. ^[4]	3
9	VeeR	Receiver Ground (Common with Transmitter Ground) ^[1]	1
10	VeeR	Receiver Ground (Common with Transmitter Ground) ^[1]	1
11	VeeR	Receiver Ground (Common with Transmitter Ground) ^[1]	1
12	RD-	Receiver Inverted DATA out. AC Coupled ^[3]	3
13	RD+	Receiver Non-inverted DATA out. AC Coupled ^[3]	3
14	VeeR	Receiver Ground (Common with Transmitter Ground) ^[1]	1
15	VccR	Receiver Power Supply ^[2]	2
16	VccT	Transmitter Power Supply ^[2]	2
17	VeeT	Transmitter Ground (Common with Receiver Ground) ^[1]	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. ^[3]	3
19	TD-	Transmitter Inverted DATA in. AC Coupled. Transmitter ^[3]	3
20	VEET	Ground (Common with Receiver Ground) ^[1]	1

Notes:

- [1] TX Fault is open collector output which should be pulled up externally with a 4.7K ~10KΩ resistor on the host board to voltage between 2.0V and VCC+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
- [2] TX Disable input is used to shut down the laser output per the state table below. It is pulled up within the module with a 4.7~ 10K resistor.
- | | |
|--------------------------|----------------------|
| Low (0 - 0.8V): | Transmitter on |
| Between (0.8V and 2.0V): | Undefined |
| High (2.0 - VccT): | Transmitter Disabled |
- [3] 3MOD-DEF 0, 1, 2. These are the module definition pins. They should be pulled up with a 4.7~10K resistor on the host board to supply less than VccT+0.3V or VccR+0.3V.
MOD-DEF 0 is grounded by the module to indicate that the module is present.
MOD-DEF 1 is clock line of two wire serial interface for optional serial ID.
MOD-DEF 2 is data line of two wire serial interface for optional serial ID.
- [4] LOS (Loss of signal) is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.

10. Pin arrangement

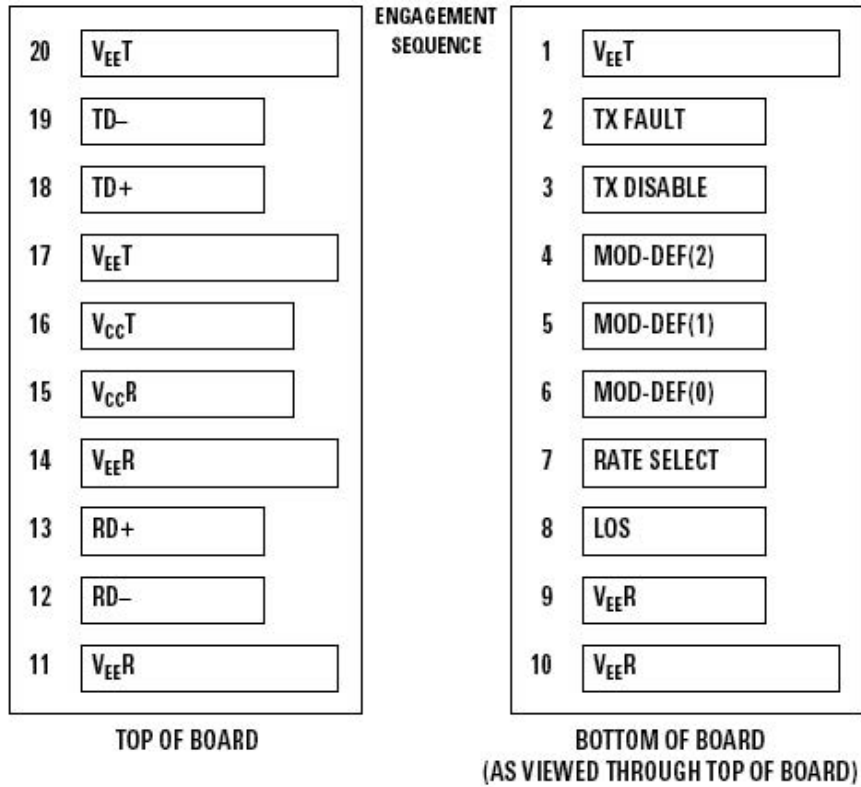


Figure 1. Pin out of Connector Block on Host Board.

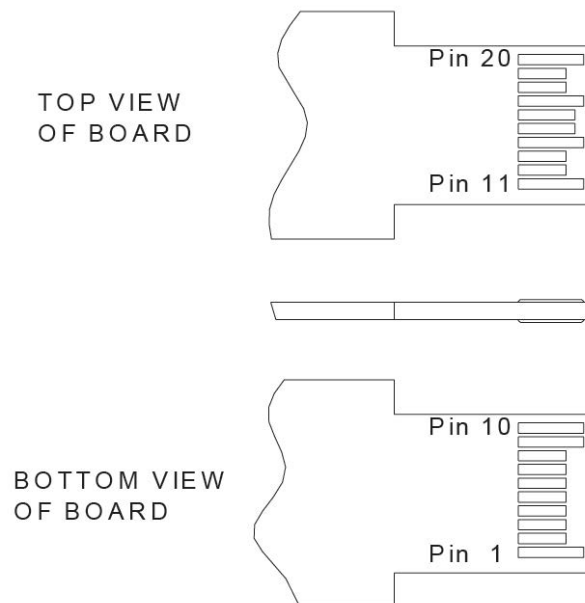


Figure 2. Pin on board.

11. Mechanical Diagram

(Unit: mm)

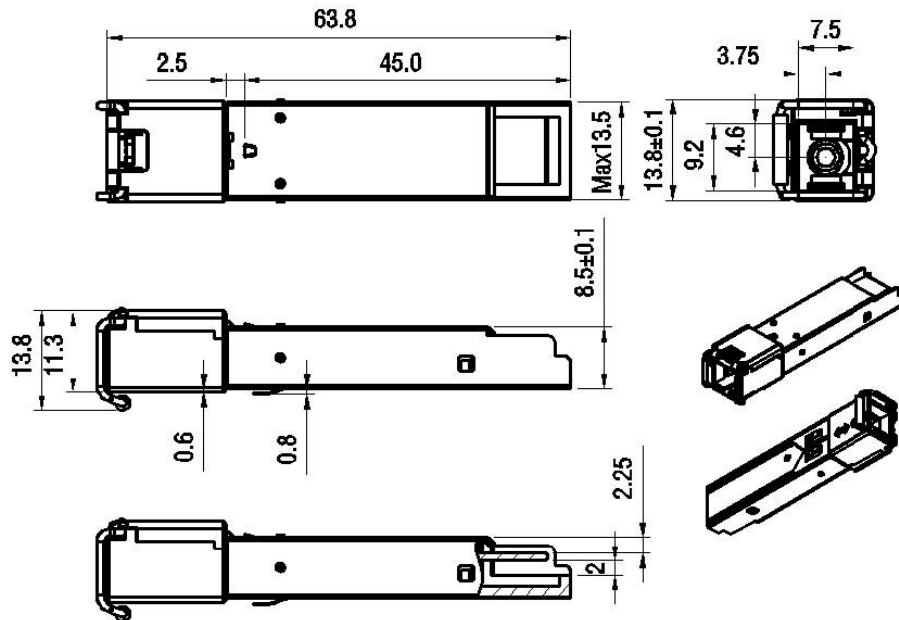


Figure 3. Mechanical Diagram