

Professional high-speed optical transceiver

OPN-S3R1513-03SC / OPN-S3R1513-03SCI

1550 nm TX / 1310 nm RX , 3.3V / 2.5 Gb/s RoHS Compliant Single-Fiber MM Transceiver

PRODUCT FEATURES

- Single Fiber Bi-Directional MM Transceiver
 - Speed up to 2.67 Gb/s
 - 1550 nm Transmitter
 - 1310 nm Receiver
 - Distance 0 to 300 m at 2.5 Gb/s
- 0 to 70°C Operating: OPN-S3R1513-03SC
- -50 to 85°C Operating: OPN-S3R1513-03SCI
 - 2x5 Package with SC Receptacle
 - LVTTTL Signal Detect Output
 - Single +3.3 V Power Supply
 - RoHS Compliant
- PECL Differential Inputs and Outputs
 - Wave Solderable
- Class 1 Laser International Safety Standard IEC-60825Compliant

APPLICATIONS

- WDM OC-48/STM-16 Links
- Gigabit Ethernet Interconnect
 - Fiber Channel Links

PRODUCT DESCRIPTION

The OPN-S3R1513-03SCI series are high performance modules for multi-mode single fiber communications by using 1550 nm transmitter and 1310 nm receiver. The transmitter section uses a multiple quantum well laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated 1310 nm detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. A PECL logic interface simplifies interface to external circuitry. LV-TTL Signal Detect is used.

ORDER INFORMATION

P/No.	Bit Rate (Gb/s)	Distance (m)	TX (nm)	RX (nm)	Voltage (V)	Package	Temp.(°C)	TX Power (dBm)	RX Sens. (dBm)	RoHS Compliant
OPN-S3R1513-03SC	2.5	0 to 300	1550	1310	3.3	SC, 2X5	0 to 70	0 to -10	-16	Yes
OPN-S3R1513-03SCI	2.5	0 to 300	1550	1310	3.3	SC, 2X5	-50 to 85	0 to -10	-16	Yes

Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-50	85	°C	
Operating Temperature	Topr	0 -50	70 85	°C	OPN-S3R1513-03SC OPN-S3R1513-03SCI
Soldering Temperature	---		260	°C	10 seconds on leads only
Power Supply Voltage	Vcc	0	3.6	V	
Input Voltage	---	GND	Vcc	V	
Output Current	Iout	0	30	Ma	

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Recommended Operating Conditions					
Parameter	Symbol	Min	Typ	Max	Units / Notes
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V
Operating Temperature	T _{opr}	0 -50		70 85	°C / OPN-S3R1513-03SC °C / OPN-S3R1513-03SCI
Data Rate		1000	2488	2670	Mb/s
Power Supply Current	I _{CC}			260	mA

Transmitter Specifications (0°C < T _{opr} < 70°C, 3.13V < V _{CC} < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Optical Transmit Power	P _o	-10		0	dBm	1
Output Center Wavelength	λ	1480		1580	nm	
Output Spectrum Width	Δλ			4	nm	RMS(σ)
Output Eye	Compliant with IEEE 802.3z					
Optical Rise Time	t _r			0.26	Ns	20% to 80% Values
Optical Fall Time	t _f			0.26	ns	20% to 80% Values
Relative Intensity Noise	RIN			-120	dB/Hz	
Total Jitter	TJ			0.227	ns	2
Electrical						
Data Input Current – Low	I _{IL}	-350			μA	
Data Input Current – High	I _{IH}			350	μA	
Differential Input Voltage	V _{IH} - V _{IL}	300		1600	mV	
Data Input Voltage – Low	V _{IL} - V _{CC}	-2.0		-1.58	V	3
Data Input Voltage -- High	V _{IH} - V _{CC}	-1.1		-0.74	V	3
Disable Input Voltage -- Low	V _{TDIS, L}	0		0.8	V	TX Output Enabled
Disable Input Voltage – High	V _{TDIS, H}	V _{CC} -1.3		V _{CC}	V	TX Output Disabled
Shut Off Time for TxDis	t _{DIS}			1	ms	

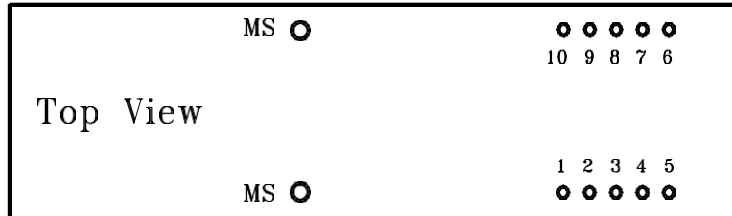
- Notes: 1. Output power is power coupled into a 62.5/125 μm multi- mode fiber.
 2. Measured with a 2⁷-1 PRBS.
 3. These inputs are compatible with 10K, 10KH and 100K ECL and LVPECL inputs.

Receiver Specifications (0°C < T _{opr} < 70°C, 3.13V < V _{CC} < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Sensitivity	---	---	---	-16	dBm	1
Maximum Input Power	P _{in}	-3		---	dBm	
Signal Detect -- Asserted	P _a	---	---	-16	dBm	Transition: low to high
Signal Detect -- Deasserted	P _d	-31	---	---	dBm	Transition: high to low
Signal detect -- Hysteresis		1.0	---		dB	
Wavelength of Operation		1260		1360	Nm	2
Optical Return Loss	ORL	20			dB	
Electrical						
Data Output Voltage Swing	V _{OH} - V _{OL}	0.575		0.930	V	
SD Output Voltage -- Low	V _{OL}	0		0.8	V	
SD Output Voltage -- High	V _{OH}	2.0		V _{CC} + 0.3	V	
Signal Detect Assert Time	A _S _{MAX}			100	μs	OFF to ON
Signal Detect Deassert Time	A _N _S _{MAX}			300	μs	ON to OFF

- Notes: 1. Minimum sensitivity and saturation levels at BER=1E-10 for a 2²³-1 PRBS.
 2. At least 30 dB optical isolation for the wavelength 1260 to 1360 nm.

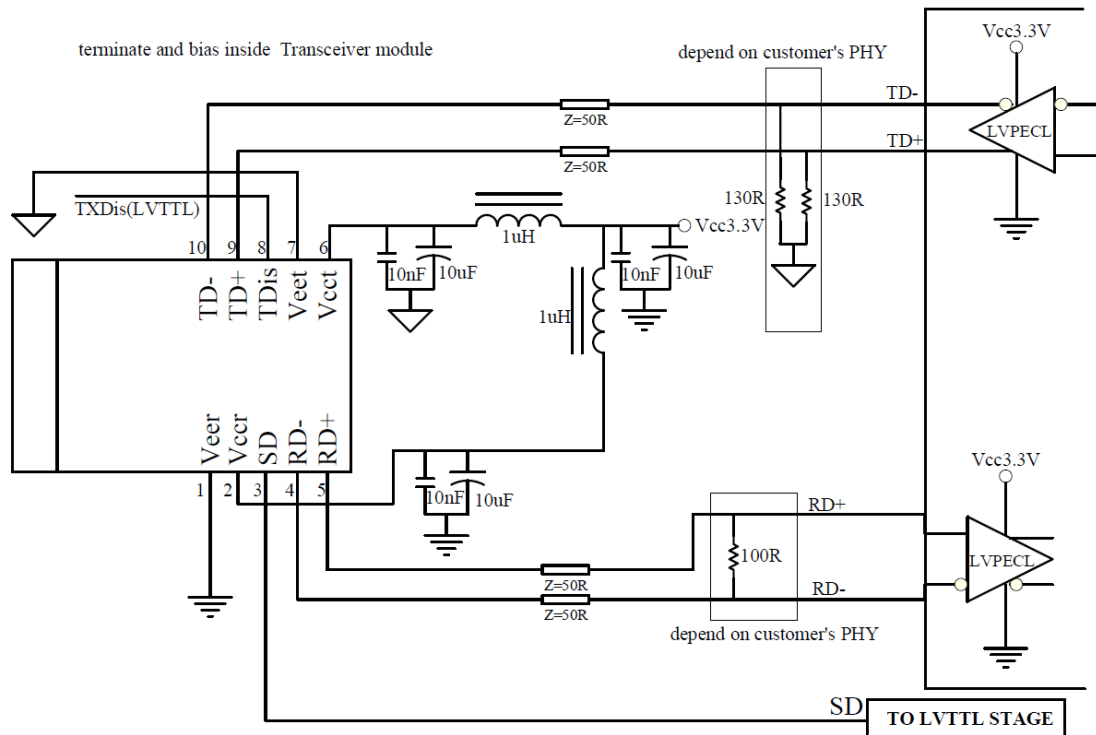
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CONNECTION DIAGRAM



PIN	Symbol	Notes
1	V_{EEF}	Directly connect this pin to the receiver ground plane
2	V_{CCR}	+3.3V dc power for the receiver section
3	SD	Active high on this indicates a received optical signal.
4	RD-	Receiver Data out Bar. See recommended circuit schematic
5	RD+	Receiver Data out.. See recommended circuit schematic
6	V_{CCT}	+3.3V dc power for the transmitter section
7	V_{EET}	Directly connect this pin to the transmitter ground plane
8	TxDis	Transmitter Disable. Connect this pin to +3.3V TTL logic "1" to disable module To enable module connect to TTL logic low "0"
9	TD+	Transmitter Data in.. See recommended circuit schematic
10	TD-	Transmitter Data in Bar. See recommended circuit schematic
MS	MS	Mounting Studs. Connect to Chassis Ground

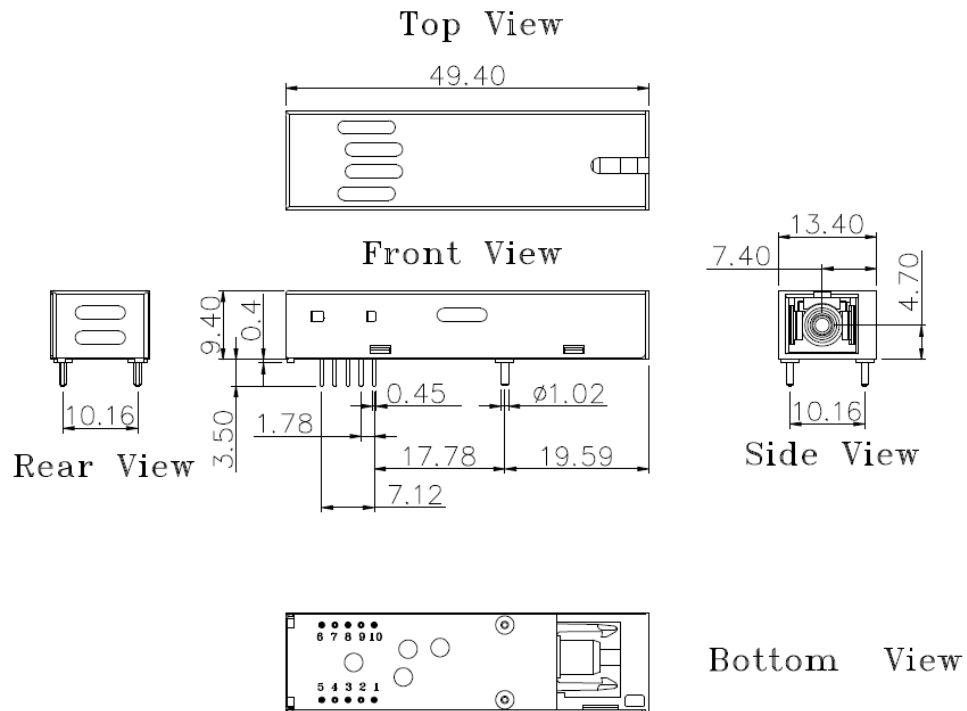
RECOMMENDED CIRCUIT SCHEMATIC



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PACKAGE DIAGRAM

Units in mm



Note: Specifications subject to change without notice.