

Professional high-speed optical transceiver

OPN-S8G15-5D50SC / OPN-S8G15-5D50SCI
OPN-S8G15-5D50SC-EMG / OPN-S8G15-5D50SCI-EMG
OPN-S8G15-5D50ST / OPN-S8G15-5D50STI
OPN-S8G15-5D50FC / OPN-S8G15T-5D50FCI
OPN-S8G15T-5D50SC / OPN-S8G15T-5D50SCI
OPN-S8G15T-5D50SC-EMG / OPN-S8G15T-5D50SCI-EMG
OPN-S8G15T-5D50ST / OPN-S8G15T-5D50STI
OPN-S8G15T-5D50FC / OPN-S8G15T-5D50FCI

5V / 1550 nm / 1.25 Gbps RoHS Compliant Optical Single-Mode Transceiver

PRODUCT FEATURES

- Duplex SC Single Mode Transceiver: OPN-S8G15-5D50SC
- Duplex ST Single Mode Transceiver: OPN-S8G15-5D50ST
- Duplex FC Single Mode Transceiver: OPN-S8G15-5D50FC
 - Compliant with IEEE 802.3z Gigabit Ethernet
 - 1550 DFB LD Transmitter
 - 19 dB Power Budget At Least
 - Industry Standard 1 x 9 Footprint
 - Single +5 V Power Supply
 - RoHS Compliant
 - 0 to 70°C Operating: OPN-S8G15T-5D50SC
 - -50 to 85°C Operating: OPN-S8G15T-5D50SCI
 - PECL Signal Detect Output: OPN-S8G15-5D50SCI
 - TTL Signal Detect Output: OPN-S8G15T-5D50SCI
 - Wave Solderable
- Class 1 Laser International Safety Standard IEC 60825Compliant

APPLICATIONS

- Switch to Switch Interface
- High Speed Interface for File Servers
- High Performance Desktops

PRODUCT DESCRIPTION

The OPN-S8G15T-5D50SCI series single mode transceiver is a low power, high performance module for bi-directional serial optical data communications such Gigabit Ethernet andFibre Channel. This module is designed for single mode fiber and operates at a nominal wavelength of 1550 nm. A guaranteed minimum optical link budget of 19 dB is offeredwhich can correspond to a link distance of over 50 km (assuming worst case fiber loss of 0.3 dB/km). The transmitter section uses a multiple quantum well laser and isa class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. A PECLlogic interface simplifies interface to external circuitry.

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ORDER INFORMATION

P/No.	Bit Rate (Mb/s)	1000 BASE	Distance (km)	Wavelength (nm)	Voltage (V)	Package	Temp. (°C)	TX Power (dBm)	RX Sens. (dBm)	RoHS Compliant
OPN-S8G15T-5D50SC	1250	XD	50	1550 DFB	5	1X9 SC/ST/FC	0 to 70	0 to -5	-24	Y
OPN-S8G15T-5D50SCI	1250	XD	50	1550 DFB	5	1X9 SC/ST/FC	-50 to 85	0 to -5	-24	Y

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-50	85	°C	
Operating Temperature	Topr	0 -50	70 85	°C	OPN-S8G15T-5D50SC OPN-S8G15T-5D50SCI
Soldering Temperature	---		260	°C	10 seconds on leads only
Power Supply Voltage	Vcc	0	6	V	
Input Voltage	---	GND	Vcc	V	
Output Current	Iout	0	30	mA	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units
Power Supply Voltage	Vcc	4.75	5	5.25	V
Operating Temperature	Topr	0 -50		70 85	°C / OPN-S8G15T-5D50SC °C / OPN-S8G15T-5D50SCI
Data Rate			1250	1300	Mb/s
Power Supply Current	Icc		180	280	mA

Transmitter Specifications (0°C < Topr < 70°C, 4.75V < Vcc < 5.25V)

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Optical Transmit Power	Po	-5	---	0	dBm	1
Output Center Wavelength	λ	1480		1580	nm	
Output Spectrum Width	$\Delta\lambda$	---	---	1	nm	-20 dB Width
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	9	---	---	dB	
Output Eye	Compliant with IEEE 802.3z					
Optical Rise Time	tr			0.26	ns	20% to 80% Values
Optical Fall Time	tf			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	IL	-350			μA	
Data Input Current – High	I _H			350	μA	
Differential Input Voltage	V _{IH} - V _{IL}	300			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

Notes: 1. Output power is power coupled into a 9/125 μm single mode fiber.

2. Measured with a 2⁷-1 PRBS.

3. These inputs are compatible with 10K, 10KH and 100K ECL and LVPECL inputs.

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Receiver Specifications (0°C < Topr < 70°C, 4.75V < Vcc < 5.25V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Sensitivity	---	---	---	-24	dBm	1
Maximum Input Power	Pin	-3		---	dBm	
Signal Detect -- Asserted	Pa	---	---	-24	dBm	Transition: low to high
Signal Detect -- Deasserted	Pd	-50	---	---	dBm	Transition: high to low
Signal detect -- Hysteresis		1.0	---		dB	
Wavelength of Operation		1100	---	1600	nm	
Electrical						
Data Output Voltage -- Low	V _{OL} - V _{CC}	-2.0		-1.58	V	2
Data Output Voltage -- High	V _{OH} - V _{CC}	-1.1		-0.74	V	2
Signal Detect Output Voltage -- Low	V _{OL} - V _{CC}	-2.0		-1.58	V	OPN-S8G15-5D50SCI
Signal Detect Output Voltage -- High	V _{OH} - V _{CC}	-1.1		-0.74	V	
Signal Detect Output Voltage -- Low	V _{SDL}			0.5	V	OPN-S8G15T-5D50SCI
Signal Detect Output Voltage -- High	V _{SDH}	2.0			V	

Notes: 1. Minimum sensitivity and saturation levels at BER=1E-12 for a 2⁷-1 PRBS.

2. These outputs are compatible with 10K, 10KH and 100K ECL and PECL outputs.

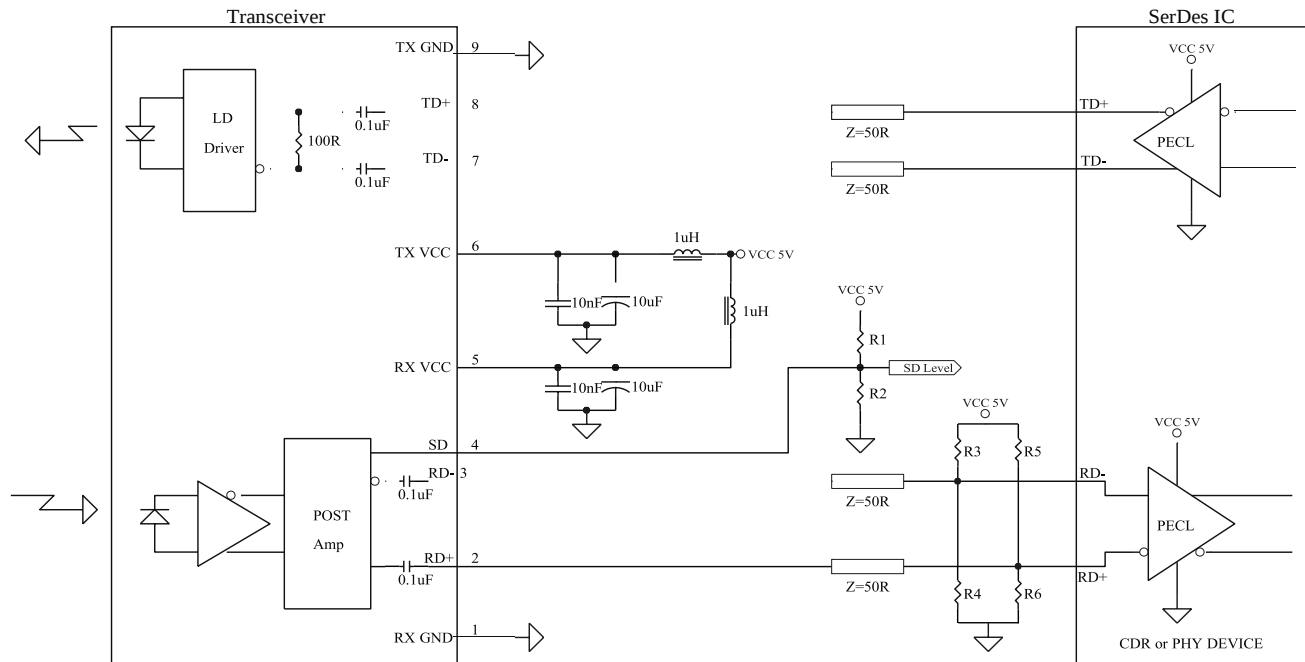
CONNECTION DIAGRAM

Receiver Signal Ground	1 (Rx GND)	○
Receiver Data Out	2 (RD+)	N/C
Receiver Data Out Bar	3 (RD-)	
Signal Detect	4 (SD)	
Receiver Power Supply	5 (Rx Vcc)	TOP VIEW
Transmitter Power Supply	6 (Tx Vcc)	
Transmitter Data In Bar	7 (TD-)	
Transmitter Data In	8 (TD+)	N/C
Transmitter Signal Ground	9 (Tx GND)	○

PIN	Symbol	Notes
1	Rx GND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical signal
5	Rx Vcc	+5V dc power for the receiver section
6	Tx Vcc	+5V dc power for the transmitter section
7	TD-	See recommended circuit schematic
8	TD+	See recommended circuit schematic
9	Tx GND	Directly connect this pin to the transmitter ground plane

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RECOMMENDED CIRCUIT SCHEMATIC



For TTL SD Level, $R1=R2=N.C.$, $R3=R5=82R$, $R4=R6=130R$

For PECL SD Level, $R1=R3=R5=82R$, $R2=R4=R6=130R$

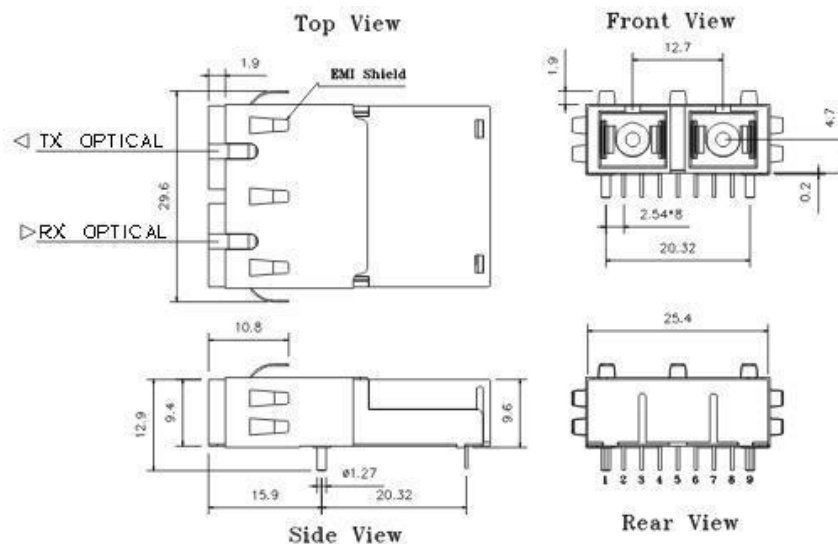
The split-load terminations for ECL signals need to be located at the input of devices receiving those ECL signals. The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module Rx Vcc and Tx Vcc. A GND plane under the module is required for good EMI and sensitivity performance.

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PACKAGE DIAGRAM

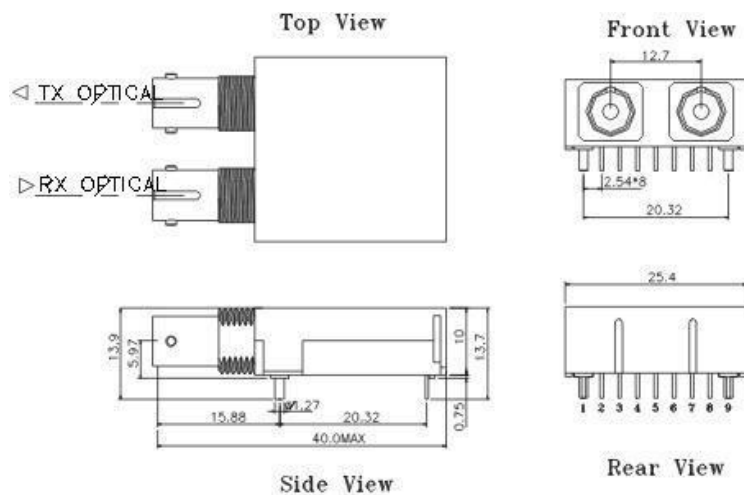
Units in mm

1) SC Type With Extended Shielding



OPN-S8G15-5D50SC-EMG / OPN-S8G15T-5D50SC-EMG

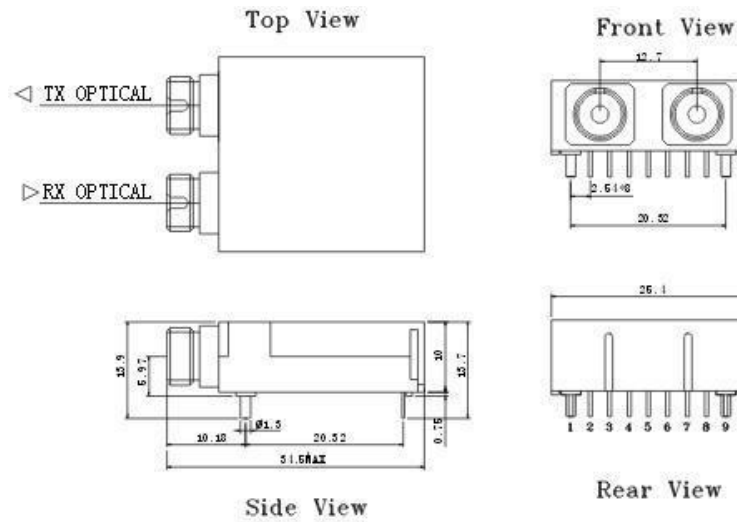
2) ST Type



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3) FC Type



OPN-S8G15-5D50FC / OPN-S8G15T-5D50SC

Note: Specifications subject to change without notice.