

Professional high-speed optical transceiver

OPN-S8G15-180SC / OPN-S8G15T-180SC
OPN-S8G15-180SC-EMG / OPN-S8G15T-180SC-EMG
OPN-S8G15-180ST / OPN-S8G15T-180ST
OPN-S8G15-180FC / OPN-S8G15T-180FC

3.3V / 1550 nm / 1.25 Gbps RoHS Compliant Optical Single-Mode Transceiver

PRODUCT FEATURES

- Duplex SC Single Mode Transceiver: OPN-S8G15-180SC
- Duplex ST Single Mode Transceiver: OPN-S8G15-180ST
- Duplex FC Single Mode Transceiver: OPN-S8G15-180FC
 - Compliant with IEEE 802.3z Gigabit Ethernet
 - 1550 nm DFB LD Transmitter
 - High Sensitivity APD Receiver
 - 38 dB Power Budget At Least
 - Distance up to 180 km
 - 0 to 70°C Operating
 - Industry Standard 1 x 9 Footprint
 - Single +3.3 V Power Supply
 - RoHS Compliant
 - LVPECL Signal Detect Output: OPN-S8G15-180FC
 - LVTTTL Signal Detect Output: OPN-S8G15T-180FC
 - 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-180FC series single mode transceiver is a low power, high performance module for bi-directional serial optical data communications such Gigabit Ethernet and Fibre 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 38 dB is offered which can correspond to a link distance of over 180 km (assuming worst case fiber loss of 0.20 dB/km). 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 InGaAs Avalanche photodetector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. A PECL logic interface simplifies interface to external circuitry.

ORDER INFORMATION

P/No.	Bit Rate (Mb/s)	IEEE 802.3z	Distance (km)	Wavelength (nm)	Voltage (V)	Package	Temp. (°C)	TX Power (dBm)	RX Sens. (dBm)	RoHS Compliant
OPN-S8G15T-180FC	1250	EZX	180	1550 DFB	3.3	1X9 SC/ST/FC	0 to 70	6 to 3	-35	Yes

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Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-50	85	°C	
Operating Temperature	Topr	0	70	°C	
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	

Recommended Operating Conditions					
Parameter	Symbol	Min	Typ	Max	Units
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Operating Temperature	Topr	0		70	°C
Data Rate			1250	1300	Mb/s
Power Supply Current	Icc			280	mA

Transmitter Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Optical Transmit Power	Po	3	---	6	dBm	1
Output Center Wavelength	λ	1500	1550	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 _{IH}			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.

Receiver Specifications (0°C < Topr < 70°C, 3.13V < Vcc < 3.47V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical						
Sensitivity	---	---	---	-35	dBm	1
Maximum Input Power	Pin	-9		---	dBm	
Signal Detect -- Asserted	Pa	---	---	-35	dBm	Transition: low to high
Signal Detect -- Deasserted	Pd	-45	---	---	dBm	Transition: high to low
Signal detect -- Hysteresis		1.0	---		dB	
Wavelength of Operation		1100	---	1600	nm	

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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-S8G15-180FC
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-180FC
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 at ER=9 dB.

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

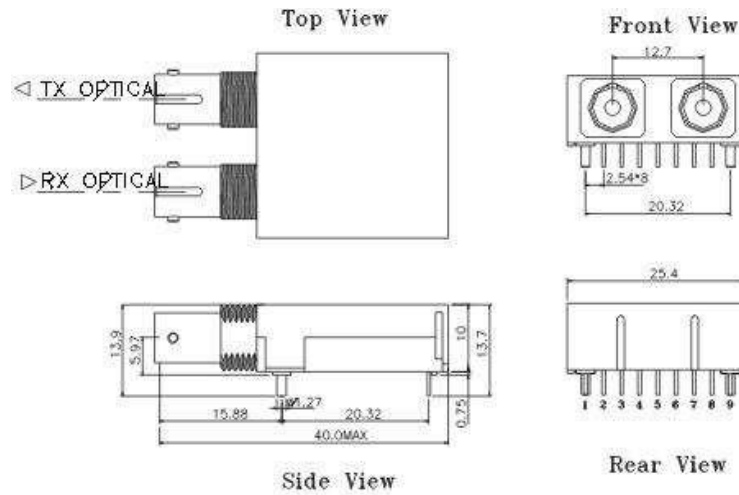
CONNECTION DIAGRAM

Receiver Signal Ground	1 (Rx GND)	TOP VIEW	○
Receiver Data Out	2 (RD+)		N/C
Receiver Data Out Bar	3 (RD-)		
Signal Detect	4 (SD)		
Receiver Power Supply	5 (Rx Vcc)		
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	+3.3V dc power for the receiver section
6	Tx Vcc	+3.3V 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

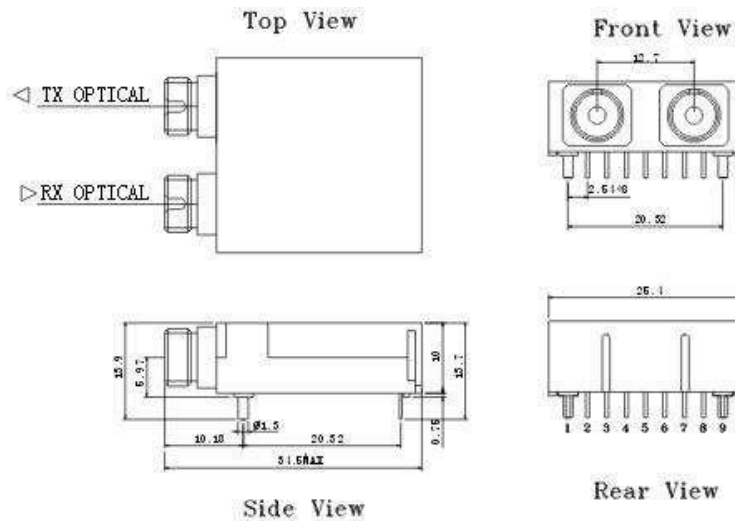
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2) ST Type



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3) FC Type



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Note: Specifications subject to change without notice.