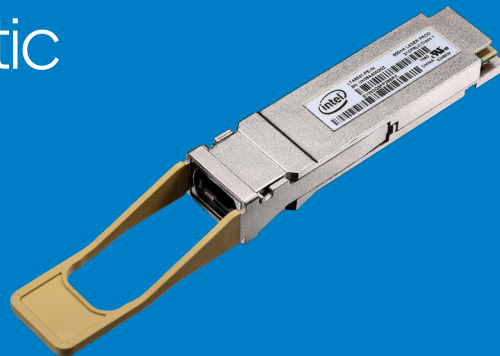


# Intel® Ethernet QSFP28 Optic



**Intel® Ethernet QSFP28 Optic delivers high-performing computing interconnect for deployments of 100GbE**

## Key Features

- Hot-pluggable QSFP28 optical transceiver
- Up to 100 m link on OM4 multi-mode fiber (MMF)
- Four independent parallel optical channels
- Max power 2.5 W
- QSFP28 MSA compliance
- Power class 3
- Case operating temperature 0 to 85 °C
- RoHS II Compliance
- Meets standard BER of 5E-5

## Overview

Intel® Ethernet QSFP28 Optic is an excellent choice for up to 100 meter reach in multimode fiber systems for high-speed communications equipment. Ideal for short-range multi-lane data communication and interconnects applications, the 100GbE QSFP28 SR4 transceiver is a high-performing module for SR optical links. There are four independent transmit and receive channels, each capable of 25Gbps operation, for an aggregate data rate of 100Gbps up to 100 meters over OM4 MMF.

When used with Intel® Ethernet Network Adapters with QSFP28 connectivity, these optics provide interoperability and secure connections for virtualization, high-speed networking, and consistently reliable performance. Extended case operating temperature allows for system flexibility to support a range of requirements.

## General Specifications

Module Form Factor	QSFP28
Network Standards Physical Layer Interface	100GBASE-SR4
Airflow and Temperature Guidelines	Refer to adapter product brief for specific airflow and temperature requirements
Module Specifications	Electrical: SFF-8679 I2C Register interface: SFF-8636 Mechanical: SFF-8661

## Product Order Code

Intel® Ethernet QSFP28 Optic E100GQSFP28SRX

## SR4 Transmitter Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Note
Average Launch Power, each lane	P <sub>OUT</sub>	-8.4	-	2.4	dBm	Average Optical Output
Optical modulation Amplitude, each lane	OMA	-6.4	-	3	dBm	
Extinction Ratio	ER	2	-	-	dB	
Optical Output with Tx OFF	P <sub>OFF</sub>	-	-	-30	dBm	
Center Wavelength	λ	840	850	860	nm	
RMS Spectral Width	Δλ	-	-	0.6	nm	
Optical return loss tolerance	ORL	-	-	12	dB	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}						
Hit ratio 1.5 × 10 <sup>-3</sup> hits per sample		{0.3, 0.38, 0.45, 0.35, 0.41, 0.5}				

## SR4 Receiver Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Note
Average power at receive input, each lane	P <sub>IN</sub>	-	-	2.4	dBm	1
Average power at receive input, each lane	P <sub>IN</sub>	-10.3	-	-	dBm	1, 2
Unstressed receiver sensitivity, each lane (max)	Sen	-	-	-7.2	dBm	1
Center Wavelength	λ	840	850	860	nm	
Receiver Reflectance	RFL	-	-	-12	dB	
Rx_LOS of Signal - Assert	P <sub>A</sub>	-30	-	-	dBm	
Rx_LOS of Signal - Deassert	P <sub>D</sub>	-	-	-7.5	dBm	
Rx_LOS of Signal - Hysteresis	P <sub>Hy</sub>	-	1.5	-	dBm	

### Notes:

1. Average received power where the BER = 5x10<sup>-5</sup>, measured with a PRBS 2<sup>31</sup>-1 test pattern@25.78Gb/s.
2. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.

## SR4 Transmitter Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Tx_Data Differential Input Voltage	$V_{IN}$	200	-	900	mV	
Tx_Data Differential Input Impedance	$Z_{IN}$	-	100	-	$\Omega$	
Differential Input Return Loss	SDD11	Compatible with IEEE P802.3bm	-	-	dB	10MHz to 19GHz
Differential to Common Mode Conversion Loss	SCD11	10	-	-	dB	10MHz to 19GHz

## SR4 Receiver Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Rx_Data Differential Output Voltage	$V_{OUT}$	-	480	-	mV	
Rx_Data Differential Output Impedance	$Z_{OUT}$	-	100	-	$\Omega$	
Differential Output Return Loss		Per IEEE P802.3bm			dB	10MHz to 19GHz
Common Mode Output Return Loss		Per IEEE P802.3bm			dB	10MHz to 19GHz

## SR4 Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Note
Storage Ambient Temperature	$T_{stg}$	-40	-	+85	$^{\circ}\text{C}$	1
Relative Humidity - Storage	$RH_s$	0	-	95	%	1
Relative Humidity - Operating	$RH_o$	0	-	85	%	1
Module Supply Voltage	Vcc	-0.5	-	3.6	V	1

### Notes:

1. Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.

## SR4 Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units	Note
Case Operating Temperature	$T_{case}$	0	+25	+85	$^{\circ}\text{C}$	Temperature Range = E
Module Supply Voltage	Vcc	3.14	3.3	3.46	V	
Module Supply Current	$I_{IN}$	-	540	-	mA	
Signaling Speed Per Channel	S	-	25.78	-	Gb/s	

## Regulatory Compliance

Transceivers are Class 1 Laser Products and comply with US FDA regulations. These products are certified to meet the Class 1 eye safety requirements of EN (IEC) 60825 and the electrical safety requirements of EN (IEC) 60950. Copies of certificates are available from Intel Corporation upon request.

## For Product Information

For information about all Intel® Ethernet Products, visit:  
[intel.com/ethernet](http://intel.com/ethernet)

## Warranty

Intel® Ethernet Optics have a **limited warranty** of three years from the date of shipment.

## Customer Support

For customer support options in North America visit:  
[intel.com/content/www/us/en/support/contact-support.html](http://intel.com/content/www/us/en/support/contact-support.html)

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