



Intel® Ethernet SFP28 Optics

SFP28 Optics for the Intel® Ethernet Network Adapter XXV710



Key Features

- Support for 25.78Gb/s single lane 25GbE SR
- Dual-rate 10GbE/25GbE support
- 850 nm Oxide VCSEL laser transmitter
- Maximum power consumption 1.2 W
- Commercial temperature range 0-70 °C
- RoHS-6 compliant (lead-free)
- Compatible with the Intel® Ethernet Network Adapter XXV710
- Maximum link length of Multi Mode Fiber (MMF)
- With BER⁻⁵:
 - 100 m over OM4
 - 70 m over OM3
- With BER 10E⁻¹²:
 - 40 m over OM4
 - 30 m over OM3

Overview

Intel® Ethernet SFP28 Optics are available for customers who would like to deploy Intel® Ethernet Network Adapters with an SFP28 optic. The Intel® Ethernet Network Adapter XXV710 with SFP28 connectivity delivers a proven, reliable solution for deployments of high density Ethernet.

The Intel® Ethernet Network Adapter XXV710 supports SFP28 connectors enabling customers to have network connections via either direct attach

Twinax* copper cables, or SR and LR optical modules. The Intel® Ethernet Network Adapter XXV710 has all the server and network virtualization capabilities of the Intel® Ethernet 700 Series adapters but at 25GbE speed. With 25GbE backward compatibility to 10GbE, it provides a natural upgrade migration path for those customers who need more bandwidth.

Intel supports the ability to use Intel® Ethernet SFP28 Optics, Intel® Ethernet SFP28 Twinaxial Cables, or Intel® Ethernet QSFP28-to-SFP28 Twinaxial Breakout Cables. This helps customers create the configuration that best meets the needs of their data center environment, while ensuring compatibility.

General Specifications

Module Form Factor	SFP28
Network Standards Physical Layer Interface	10G/25GBASE-SR
Product Code	E25GSFP28SR
Airflow and Temperature Guidelines	Refer to adapter product brief for specific airflow and temperature requirements

Compatible Intel® Ethernet Network Adapter Product Codes

Configuration	No. of Ports	Single Pack	Bulk 5 Pack
Intel® Ethernet Network Adapter XXV710-DA1	1	XXV710DA1	XXV710DA1BLK
Intel® Ethernet Network Adapter XXV710-DA2	2	XXV710DA2	XXV710DA2BLK
Intel® Ethernet Network Adapter XXV710-DA1 for OCP	1	XXV710DA1OCP	N/A

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Transmitter						
Average Output Power: 50 or 62.5 MMF	P_{OUT}	-8.4		2.4	dBm	1
Optical Wavelength	λ	840		860	nm	
Spectral Width (RMS)	σ			0.60	nm	
Optical Modulation Amplitude	OMA	-6.4		3	dBm	
Transmitter Dispersion Penalty:	TDP				dBm	
25.78 Gb/s				5		2
10.3 Gb/s				2.5		3
Relative Intensity Noise	RIN			-128	dB/Hz	
Extinction Ratio	ER	2				
Receiver						
Stressed Receiver Sensitivity OMA Sensitivity @ 25.78 Gb/s	RxSENS			-5.6	dBm	
Average Receiver Power	Rx_{MAX}	-11		3	dBm	
Unstressed Receiver OMA Sensitivity @ 10.3 Gb/s	Rx_{SENS}			-11.1	dBm	
Stressed Receiver Sensitivity OMA @ 10.3Gb/s	Rx_{SENS2}			-7.5	dBm	
Optical Center Wavelength	λ_C	840		860	nm	
Optical Return Loss		12			dB	
LOS De-Assert	LOS_D			-13	dBm	
LOS Assert	LOS_A	-30			dBm	
Loss Hysteresis		0.5			dB	

Notes:

- Class 1 Laser Safety limit per FDA/CDRH, and EN (IEC) 60825 laser safety standards.
- Informative Only.
- The TDP transversal filter should be scaled from SR: for 100m OM3 and 0.65nm spectral bandwidth, the TDP filter should have tap separation of 21ps. This would introduce ~0.3dB eye closure penalty.

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage	V _{CC}	3.15		3.46	V	
Supply Current	I _{CC}			350	mA	1
Transmitter						
Input Differential Impedance	R _{in}		100		Ω	2
Single-ended Data Input Swing	V _{in,pp}	90		800	mV	
Transmit Disable Voltage	V _D	2		V _{CC}	VA	3
Transmit Enable Voltage	V _{EN}	V _{EE}		V _{CC} +0.8	V	
Receiver						
Single-ended Data Output Swing	V _{out,pp}	185		425	mV	4
LOS Fault	V _{LOS fault}	2		V _{CC,HOST}	V	5
LOS Normal	V _{LOS norm}	V _{EE}		V _{EE} +0.8	V	5
Power Supply Rejection	PSR	100			mVpp	6

Notes:

1. With established link. The total power dissipation can exceed 1 W when the module is attempting to establish link at operating case temperature below 25 °C.
2. Connected directly to Tx data input pins. AC coupling from pins into laser driver IC.
3. Or open circuit.
4. Into 100 Ω differential termination.
5. LOS is an open collector output. Should be pulled up with 4.7 K – 10 KΩ on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V.
6. Receiver sensitivity is compliant with power supply sinusoidal modulation of 20 Hz to 1.5 MHz up to specified value applied through the recommended power supply filtering network.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Note
Maximum Supply Voltage	V _{CC}	-0.5		4.0	V	
Storage Temperature	T _S	-40		85	°C	
Case Operating Temperature	T _C	0		70	°C	
Relative Humidity (non-condensing)	RH	0		85	%	

Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Note
Data Rate	BR		25.78		Gb/s	
Bit Error Rate	BER			10 ⁻¹² 10 ⁻⁸ 5E(-5)		1, 4 2 3
Fiber Length on 50/125µm high-bandwidth (OM3/M5E) MMF	L			30 50 70 100	m	1 2 3 4
Fiber Length on 50/125µm high-bandwidth (OM4/M5F) MMF	L			40 70 100	m	1 2 3

Notes:

1. From power on and end of any fault conditions.
2. After internal AC coupling. Self-biasing 100 Ω differential input.
3. 10 MHz-to-11.1 GHz range.
4. Hit ratio = 5 x 10E-5.

Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Note
Case Operating Temperature	T _{op}	0		70	°C	
Storage Temperature	T _{sto}	-40		85	°C	

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.

Customer Support

Intel® Customer Support Services offers a broad selection of programs including phone support and warranty service. For more information, contact us at www.intel.com/support.

(Service and availability may vary by country.)

For Product Information

To speak to a customer service representative regarding Intel products, please call 1-800-538-3373 (U.S. and Canada). For additional product information on Intel® Ethernet products, visit www.intel.com/ethernet.

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