

# QSFP28-100G-PSM4-L2

100GBase QSFP28  
1310nm  
2km Reach

+45 (0)32 72 66 76



info@nexgen.eu

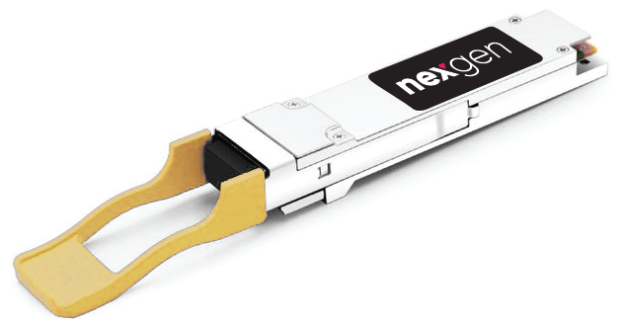


www.nexgen.eu



## Features

- QSFP28 MSA compliant
- Compliant to IEEE 802.3bm 100GBASE PSM4
- Four independent full-duplex channels
- Supports 103.1Gb/s aggregate bit rate
- Up to 2km reach for G.652 SMF
- 4x25G electrical interface (OIF CEI-28G-VSR)
- Maximum power consumption 3.5W
- Single +3.3V power supply
- Operating case temperature: 0°C to 70°C
- RoHS-6 compliant



## Applications

- 100GBASE Ethernet links
- Infiniband QDR and DDR
- Data center

Part number

Product description

QSFP28-100G-PSM4-L2

100GBase SMF QSFP28 1310nm 2km 0°C to 70°C MTP/MPO-12 DDM

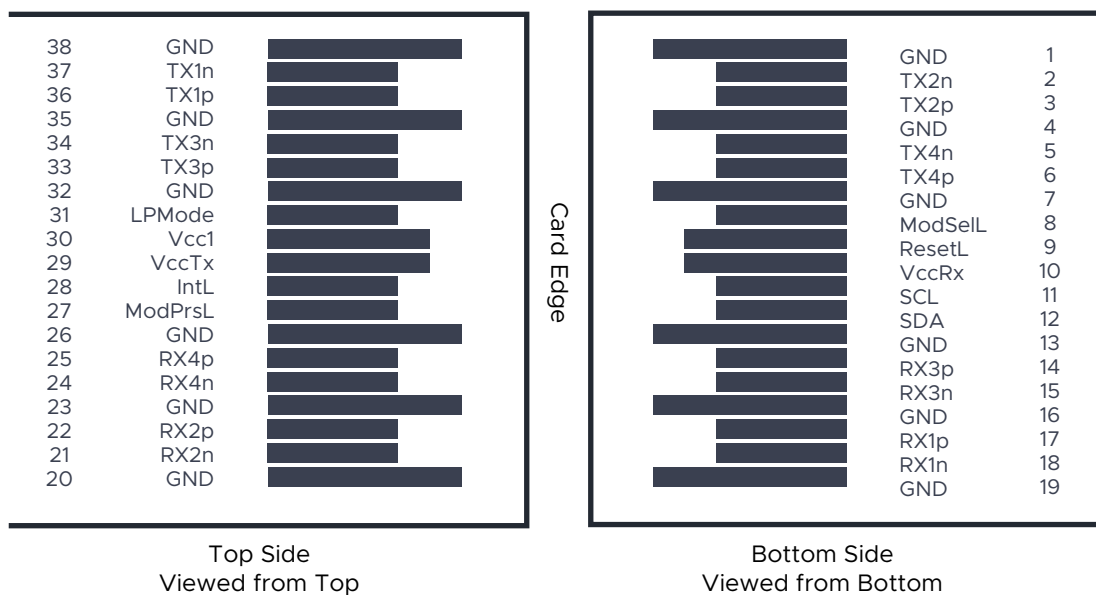
# PIN Description

Pin		Function/Description	Notes
1	GND	Transmitter Ground (Common with Receiver Ground)	1
2	Tx2-	Transmitter Inverted Data Input	
3	Tx2+	Transmitter Non-Inverted Data output	
4	GND	Transmitter Ground (Common with Receiver Ground)	1
5	Tx4-	Transmitter Inverted Data Input	
6	Tx4+	Transmitter Non-Inverted Data output	
7	GND	Transmitter Ground (Common with Receiver Ground)	1
8	ModSelL	Module Select	2
9	ResetL	Module Reset	2
10	VccRx	3.3V Power Supply Receiver	
11	SCL	2-Wire serial Interface Clock	2
12	SDA	2-Wire serial Interface Data	2
13	GND	Transmitter Ground (Common with Receiver Ground)	1
14	Rx3+	Receiver Non-Inverted Data Output	
15	Rx3-	Receiver Inverted Data Output	
16	GND	Transmitter Ground (Common with Receiver Ground)	1
17	Rx1+	Receiver Non-Inverted Data Output	
18	Rx1-	Receiver Inverted Data Output	
19	GND	Transmitter Ground (Common with Receiver Ground)	1
20	GND	Transmitter Ground (Common with Receiver Ground)	1
21	Rx2-	Receiver Inverted Data Output	
22	Rx2+	Receiver Non-Inverted Data Output	
23	GND	Transmitter Ground (Common with Receiver Ground)	1
24	Rx4-	Receiver Inverted Data Output	1
25	Rx4+	Receiver Non-Inverted Data Output	
26	GND	Transmitter Ground (Common with Receiver Ground)	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	2
29	VccTx	3.3V power supply transmitter	
30	Vcc1	3.3V power supply	
31	LPMODE	Low Power Mode	2
32	GND	Transmitter Ground (Common with Receiver Ground)	1
33	Tx3+	Transmitter Non-Inverted Data Input	
34	Tx3-	Transmitter Inverted Data Output	
35	GND	Transmitter Ground (Common with Receiver Ground)	1
36	Tx1+	Transmitter Non-Inverted Data Input	
37	Tx1-	Transmitter Inverted Data Output	
38	GND	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7K $\Omega$  to 10K $\Omega$  pull-up resistor to VccHost.

## Pin Assignment and Description



## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	T <sub>s</sub>	-40	85	°C	
Operating Case Temperature	T <sub>OP</sub>	0	70	°C	
Power Supply Voltage	V <sub>cc</sub>	-0.5	3.6	V	
Relative Humidity (non-condensation)	RH	0	85	%	
Damage Threshold , each Lane	TH <sub>d</sub>	3.0		dBm	

## Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Units
Operating Case Temperature	T <sub>OP</sub>	0		70	°C
Power Supply Voltage	V <sub>cc</sub>	3.135	3.3	3.465	V
Data Rate, each Lane			25.78125		Gb/s
Data Rate Accuracy		-100		100	ppm
Control Input Voltage High		2		V <sub>cc</sub>	V
Control Input Voltage Low		0		0.8	V
Link Distance with G.652	D	0.002		2	km

# Transceiver Electrical Characteristics

Parameter	Test Point	Min	Typical	Max	Unit s	Notes
Power Consumption				3.5	W	
Supply Current	I <sub>cc</sub>			1.06	A	
Transmitter (each Lane)						
Overload Differential Voltage pk -pk	TP1a	900			mV	
Common Mode Voltage (V <sub>cm</sub> )	TP1	-350		2850	mV	1
Differential Termination Resistance Mismatch	TP1			10	%	At 1MHz
Differential Return Loss (SDD11)	TP1			See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC11, SCD11)	TP1			See CEI-28G-VSR Equation 13-20	dB	
Stressed Input Test	TP1a		See CEI-28G-VSR Section 13.3.11.2.1			
Receiver (each Lane)						
Differential Voltage, pk-pk	TP4			900	mV	
Common Mode Voltage (V <sub>cm</sub> )	TP4	-350		2850	mV	1
Common Mode Noise, RMS	TP4			17.5	mV	
Differential Termination Resistance Mismatch	TP4			10	%	At 1MHz
Differential Return Loss (SDD22)	TP4			See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC22, SCD22)	TP4			See CEI-28G-VSR Equation 13-19	dB	
Common Mode Return Loss (SCC22)	TP4			-2	dB	2
Transition Time, 20 to 80%	TP4	9.5			ps	
Vertical Eye Closure (VEC)	TP4			5.5	dB	
Eye Width at 10 <sup>-15</sup> probability (EW15)	TP4	0.57			UI	
Eye Width at 10 <sup>-15</sup> probability (EW15)	TP4	228			mV	

Notes:

1. V<sub>cm</sub> is generated by the host. Specification includes effects of ground offset voltage.
2. From 250MHz to 30GHz.

# Transceiver Optical Characteristics

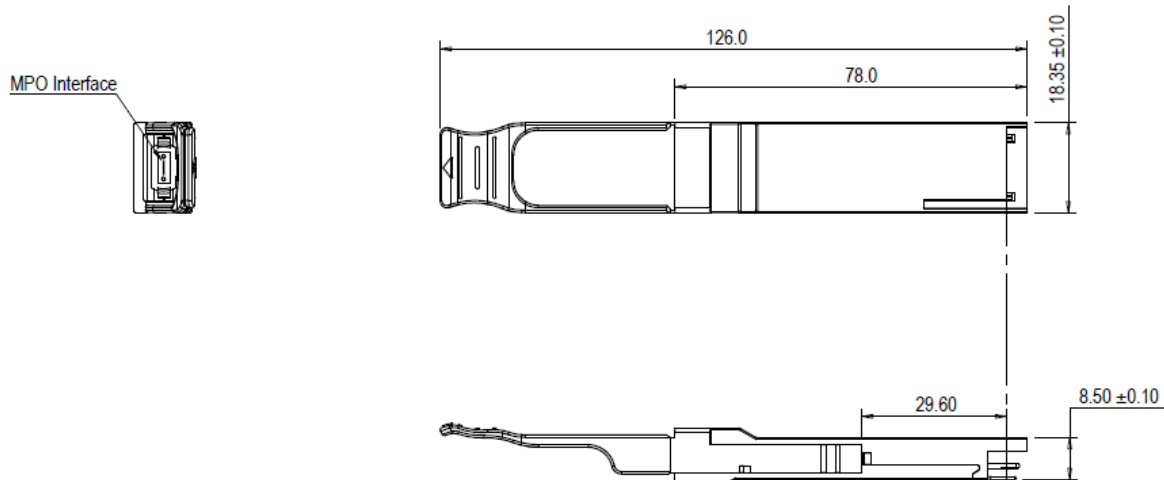
Parameter	Symbol	Min	Typical	Max	Units	Notes
Transmitter						
Center Wavelength	$\lambda_C$	1295	1310	1325	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	$P_T$			8.0	dBm	
Average Launch Power (each Lane)	$P_{AVG}$	-5.5		2.0	dBm	
Optical Modulation Amplitude (OMA), each Lane	$P_{OMA}$	-3.5		2.2	dBm	1
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP) each Lane		-4.3			dBm	
TDP, each Lane	TDP			2.9	dB	
Extinction Ratio	ER	3.5			dB	
Optical Return Loss Tolerance	TOL			20	dB	
Transmitter Reflectance	$R_T$			-12	dB	
Average Launch Power OFF Transmitter, each Lane	$P_{off}$			-30	dBm	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				
Receiver						
Center Wavelength	$\lambda_C$	1295	1310	1325	nm	
Damage Threshold each Lane	$TH_d$	3.0			dBm	2
Average Receive Power, each Lane		-10.2		2.0	dBm	
Receive Power (OMA), each Lane				2.2	dBm	
Receiver Sensitivity (OMA) each Lane	SEN 1			-9.0	dBm	for BER = $1 \times 10^{-12}$
Stressed Receiver Sensitivity (OMA), each Lane				-6.44	dBm	for BER = $1 \times 10^{-12}$
Receiver Sensitivity (OMA) each Lane	SEN 2			-11.35	dBm	for BER = $5 \times 10^{-5}$
Stressed Receiver Sensitivity (OMA), each Lane				-8.79	dBm	for BER = $5 \times 10^{-5}$
Receiver Reflectance	$R_R$			-26	dB	
LOS Assert	LOSA	-30			dBm	
LOS Deassert	LOSD			-15	dBm	
LOS Hysteresis	LOSH	0.5			dB	
Receiver Electrical 3 dB upper Cutoff Frequency, each Lane	$F_c$			31	GHz	

Vertical Eye Closure Penalty, each Lane	1.9	dB
Stressed Eye J2 Jitter each Lane	0.27	UI
Stressed Eye J4 Jitter each Lane	0.39	UI
Stressed Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}	{0.24, 0.5, 0.5, 0.24, 0.24, 0.4}	

## Notes:

1. Even if the TDP < 0.8 dB, the OMA min must exceed the minimum value specified here.
2. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.
3. Vertical eye closure penalty, stressed eye J2 jitter, stressed eye J4 jitter, and stressed receiver eye mask definition are test conditions for measuring stressed receiver sensitivity.

## Mechanical specifications



Unit : mm

## Revision history

Revision	Date	Author	Description
V1.0	11-05-2021	JGN	Initial Document

Note : Nexgen A/S reserves the right to change this document without notice.