

# QSFP28-100G-LR4-BEG

100GBase QSFP28  
LWDM4  
10km Reach

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## Features

- Supports 103.1Gb/s aggregate bit rates
- BOX Design
- Hot-pluggable QSFP28 MSA form factor
- Duplex LC Connectors
- Transmitter: cooled 4x25Gb/s EML laser
- Receiver: 4x25Gb/s PIN receiver
- IEEE 802.3ba 100GBASE-LR4 Compliant
- Single +3.3V power supply
- Power dissipation Max: 4.0W
- Built in digital diagnostic function
- Operating case temperature range: 0°C to 70°C
- RoHS Compliant



## Applications

- 100GBASE-LR4 Ethernet links
- Telecom

Part number	Product description
QSFP28-100G-LR4-BEG	100GBase SMF QSFP28 BOX EML LWDM4 10km 0°C to 70°C LC Duplex DDM

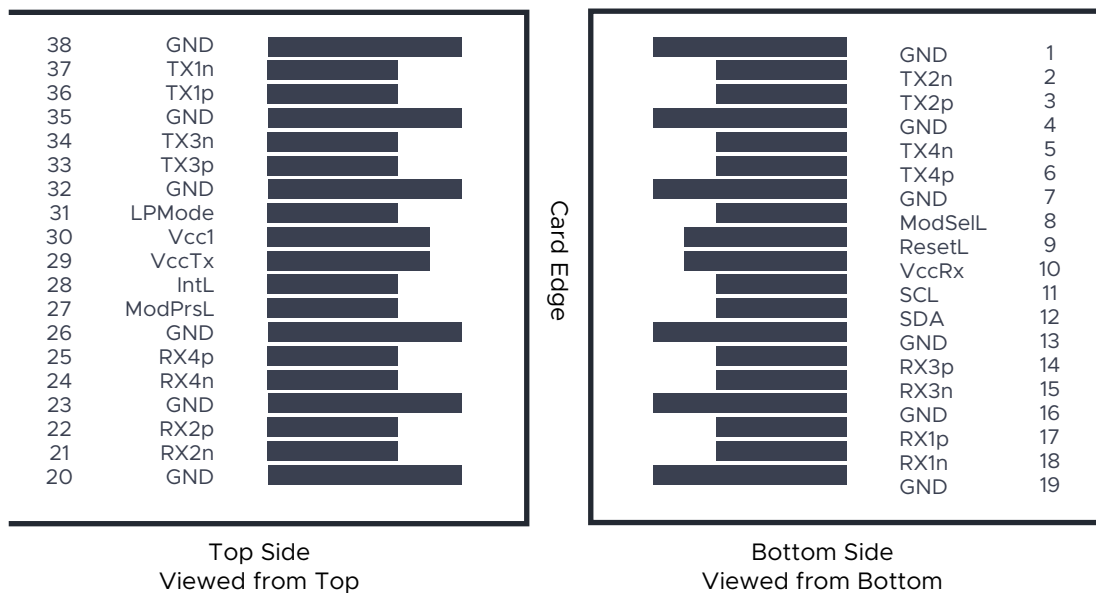
# PIN Description

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	Ts	-40	85	°C	
Power Supply Voltage	Vcc	-0.5	3.6	V	
Relative Humidity (non-condensation)	RH	5	95	%	

Notes:  
Exceeding any of these values may be harmful for the device

## Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Units
Operating Case Temperature	Tc	0	-	70	°C
Supply Voltage	Vcc	3.13	3.3	3.47	V
Data Rate per Lane	-	-	25.78125	-	Gb/s

# Transceiver Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Units	Notes
Power Dissipation	-	-	-	4.0	W	-
Supply Current	I <sub>cc</sub>	-	-	1.1544	A	-
<b>Transmitter</b>						
Input Differential Impedance	R <sub>in</sub>	-	100	-	Ω	1
Differential Data Input Swing	V <sub>in</sub> , P-P	180	-	900	mV	-
Transmit Disable Voltage	VD	V <sub>cc</sub> -1.3	-	V <sub>cc</sub>	V	-
Transmit Enable Voltage	VEN	V <sub>ee</sub>	-	V <sub>ee</sub> +0.8	V	2
<b>Receiver</b>						
Differential Data Output Swing	V <sub>out</sub> , P-P	300	-	900	mV	3
LOS Fault	V <sub>LOS</sub> fault	V <sub>cc</sub> -1.3	-	V <sub>cc</sub> Host	V	4
LOS Normal	V <sub>LOS</sub> norm	V <sub>ee</sub>	-	V <sub>ee</sub> +0.8	V	4

Notes:

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Open circuit.
3. Into 100 ohms differential termination
4. Loss Of Signal is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

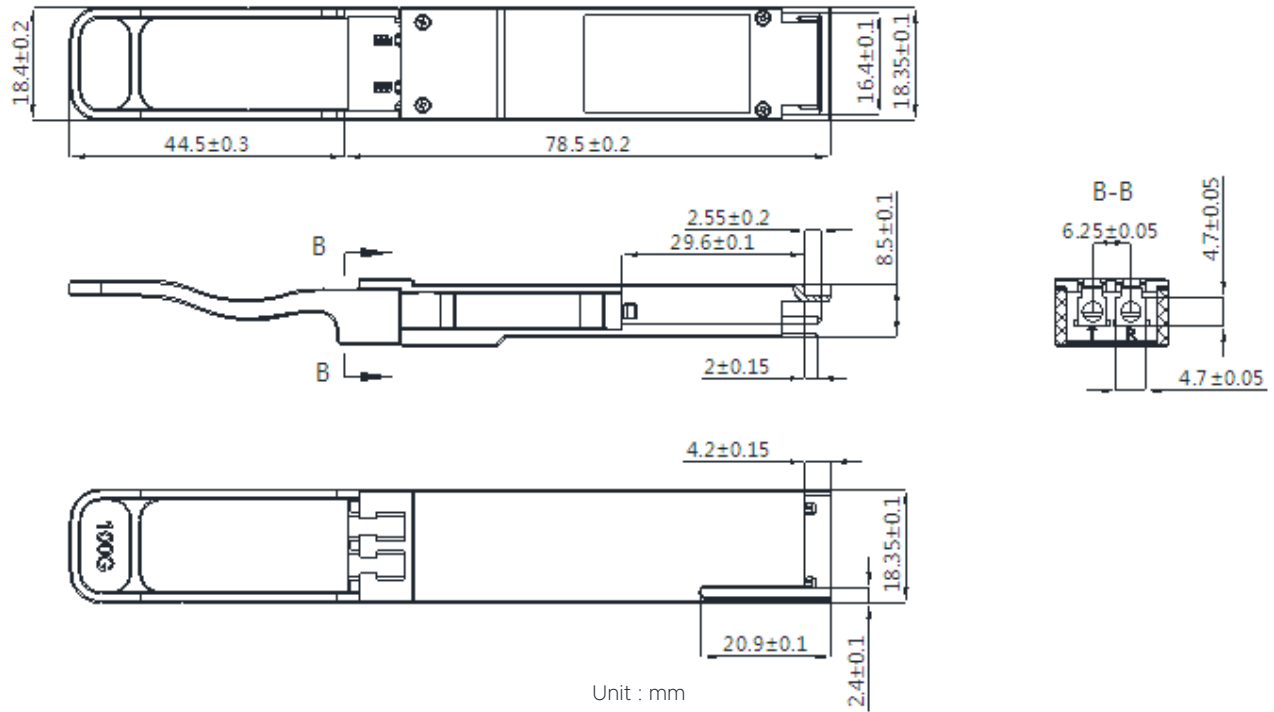
# Transceiver Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Units	Notes
<b>Transmitter</b>						
Average Launch Power per Lane	Pavg	-4.3	-	4.5	dBm	-
Total Launch Optical Power	Pout	-	-	10.5	dBm	-
Optical modulation amplitude, each lane (OMA)	OMA	-1.3	-	4.5	dBm	-
Center Wavelength Range	L1	1294.53	1295.56	1296.59	nm	-
	L2	1299.02	1300.05	1301.09	nm	-
	L3	1303.54	1304.58	1305.63	nm	-
	L4	1308.09	1309.14	1310.19	nm	-
Extinction Ratio	ER	4.0	-	-	dB	-
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Optical Return Loss Tolerance	ORLT	-	-	20	dB	-
Pout @TX - Disable Asserted per Lane	Poff	-	-	-30	dBm	-
Eye Mask {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				1
<b>Receiver</b>						
Center Wavelength	L1	1294.53	1295.56	1296.59	nm	-
	L2	1299.02	1300.05	1301.09	nm	-
	L3	1303.54	1304.58	1305.63	nm	-
	L4	1308.09	1309.14	1310.19	nm	-
Average Receive Power per Lane	Pin	-10.6	-	4.5	dBm	2
Receiver sensitivity (OMA), each lane	Psens1	-	-	-8.6	dBm	-
Overload Input Optical Power	Pmax	5.5	-	-	dBm	-
Return LOSS	RL	-26	-	-	dB	-
LOS De-Assert	LOSD	-	-	-11.6	dBm	-
LOS Assert	LOSA	-23.6	-	-	dBm	-
LOS Hysteresis	-	0.5	-	6	dB	-

Notes:

1. Hit ratio  $5 \times 10^{-5}$ .
2. Measured with a PRBS  $2^{31} - 1$  test pattern, @25.78Gb/s, BER <  $10^{-12}$ .

# Mechanical specifications



# Revision history

Revision	Date	Author	Description
V1.0	31-05-2021	JGN	Initial Document

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