

## GQXP-27B4-02D

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### 2km 100G CWDM4 QSFP28 DFB/PIN Optical Transceiver

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#### ■ Features:

- ★ Hot-pluggable QSFP28 form factor
- ★ Supports 103.1Gb/s aggregate bit rate
- ★ Power dissipation < 3.5W
- ★ RoHS-6 compliant
- ★ Commercial case temperature range of 0°C to 70°C
- ★ Adaptive CTLE
- ★ Single 3.3V power supply
- ★ Loss budget of 5 dB on up to 2 km of Single Mode Fiber (SMF) [with KR4 FEC]
- ★ Maximum link length of 10km on SMF
- ★ 4x25Gb/s CWDM transmitter
- ★ 4x25G retimed electrical interface
- ★ Duplex LC receptacle
- ★ I2C management interface

#### ■ Applications:

- ★ 100G CWDM4 applications with FEC

#### ■ Description:

GLight GQXP-27B4-02D 100G QSFP28 transceiver modules are designed for use in 100G Ethernet links on up to 2km of single mode fiber. They are compliant with the QSFP28 MSA and CWDM4 MSA and IEEE 802.3bm CAUI-4. Digital diagnostics functions are available via the I2C interface, as specified by the QSFP28 MSA. The transceiver is RoHS-6 compliant per Directive 2011/65/EU.

## ■ Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	$T_S$	-40		+85	°C
Case Operating Temperature	$T_A$	0		70	°C
Supply Voltage	$V_{CC}$	-0.5		3.6	V
Relative Humidity	RH	15		85	%
Receiver Damage Threshold, per Lane	$P_{Rdmg}$	3.5			dBm
Industrial	TC	-40		85	°C
Commercial	TC	0		70	°C

## ■ Electrical Characteristics (EOL, TOP = 0 to 70C, $V_{CC} = 3.135$ to $3.465$ Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	$V_{cc}$	3.14	3.3	3.47	V	
Supply Current	$I_{cc}$			1060	mA	
Module total power	P			3.5	W	
<b>Transmitter Section:</b>						
Signaling rate per lane		25.78125 ± 100ppm			Gb/s	
Differential data input swing per lane	$V_{in,pp,diff}$			900	mV	
Differential input return loss (min)	$RL_d(f)$	9.5 - 0.37f, $0.01 \leq f < 8$ 4.7-7.4log <sub>10</sub> (f/14), $8 \leq f < 19$			V	
Differential to common mode input return loss (min)	$RL_{dc}(f)$	22-20(f/25.78), $0.01 \leq f < 12.89$ 15-6(f/25.78), $12.89 \leq f < 19$			V	
Differential termination mismatch				10	%	
Stressed input parameters		Per IEEE 802.3bm Table 88-13				
Eye width			0.46		UI	
Applied pk-pk sinusoidal jitter						
Eye height			95		mV	
DC common mode voltage		-350		2850	mV	
<b>Receiver Section:</b>						
Signaling rate per lane		25.78125 ± 100ppm			V	
Differential data output swing	$V_{out,pp}$	100		400	mV <sub>pp</sub>	
		300		600		
		400		800		
		600		1200		
Eye width		0.57			UI	
Eye height, differential					mV	
Vertical eye closure	VEC			5.5	dB	
Transition time (20% to 80%)	$t_r, t_f$	12			ps	

## ■ Optical Characteristics (EOL, TOP = 0 to 70C, V<sub>CC</sub> = 3.135 to 3.465 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
<b>Transmitter Section:</b>						
Signaling Speed per Lane		25.78125 ± 100ppm			Gb/s	1
Center Wavelength	$\lambda_t$	1264.5 – 1277.5 1284.5 – 1297.5 1304.5 – 1317.5 1324.5 – 1337.5			nm	
Total Average Launch Power	POUT				dBm	
Average Optical Power per Lane	TXP <sub>x</sub>			2.5	dBm	8
Transmit OMA per Lane	TxOMA1	-4		2.5	dBm	
Transmit OMA per Lane @TDP max	TxOMA2	-2			dBm	2
Optical Extinction Ratio	ER	4			dB	
Transmitter and Dispersion Penalty per Lane	TDP			3	dB	3
Launch Power (OMA-TDP)	OMA-TDP	-5			dBm	
Sidemode Suppression ratio	SMSR	30			dB	
Optical Return Loss Tolerance	ORL				dB	
Average Launch Power of OFF Transmitter, per Lane				-30	dBm	
Relative Intensity Noise	RIN				dB/Hz	
Transmitter Eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				4
<b>Receiver Section:</b>						
Signaling Speed per Lane		25.78125 ± 100ppm			Gb/s	5
Lane center wavelengths (range)	$\lambda_r$	1264.5 – 1277.5 1284.5 – 1297.5 1304.5 – 1317.5 1324.5 – 1337.5			nm	
Receive Saturation (OMA) per Lane	R <sub>max</sub>	2.5			dBm	
Damage Threshold	DT	3.5			dBm	
Average Receive Power per Lane	RXP <sub>x</sub>	-			dBm	
Receive Power (OMA) per Lane	R <sub>x</sub> OMA				dBm	
Receiver Sensitivity (OMA) per Lane	R <sub>x</sub> sens			-10	dBm	6
Return Loss	RL				dB	
Stressed Sensitivity (OMA)	SRS			-10.6	dBm	7
Receive electrical 3 dB upper cutoff frequency, per lane					GHz	
Los De-Assert	LOS <sub>D</sub>			-12	dBm	
Los Assert	LOS <sub>A</sub>	-24			dBm	
Los Hysteresis	LOS <sub>H</sub>	0.5	2	2.5	dB	

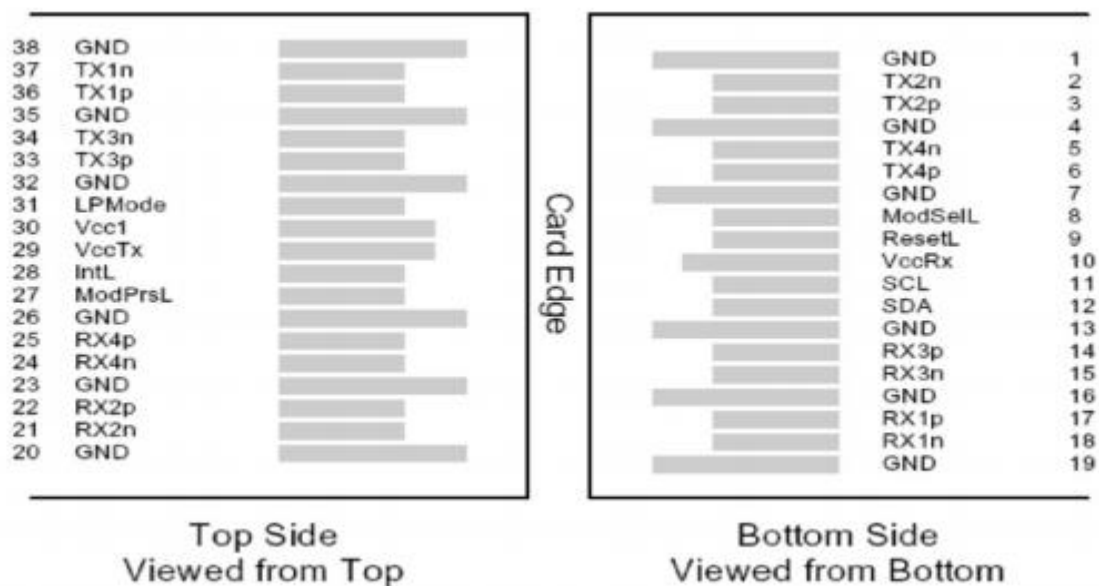
**Note:**

1. Transmitter consists of 4 lasers operating at 25.78Gb/s each.
2. At maximum TDP.
3. TDP value does not include MPI penalty.
4. Hit ratio of  $5 \times 10^{-5}$ , per IEEE.
5. Receiver consists of 4 photodetectors operating at 25.78Gb/s each.
6. Sensitivity is specified at  $5 \times 10^{-5}$  BER.
7. Measured with CWDM4 MSA conformance test signal at TP3 for  $5 \times 10^{-5}$  BER.
8. Power value and power accuracy are with all channels on.

**General Specifications**

Parameter	Symbol	Min.	Typical	Max.	Unit
Bit Rate (all wavelengths combined)	BR			103.1	Gb/s
Bit Error Ratio (pre-FEC)	BER			$5 \times 10^{-5}$	
<b>Maximum Supported Distances</b>					
Fiber Type					
SMF per G.652	Lmax			2	km

**Pin Assignment:**



## ■ Digital Diagnostics Functions

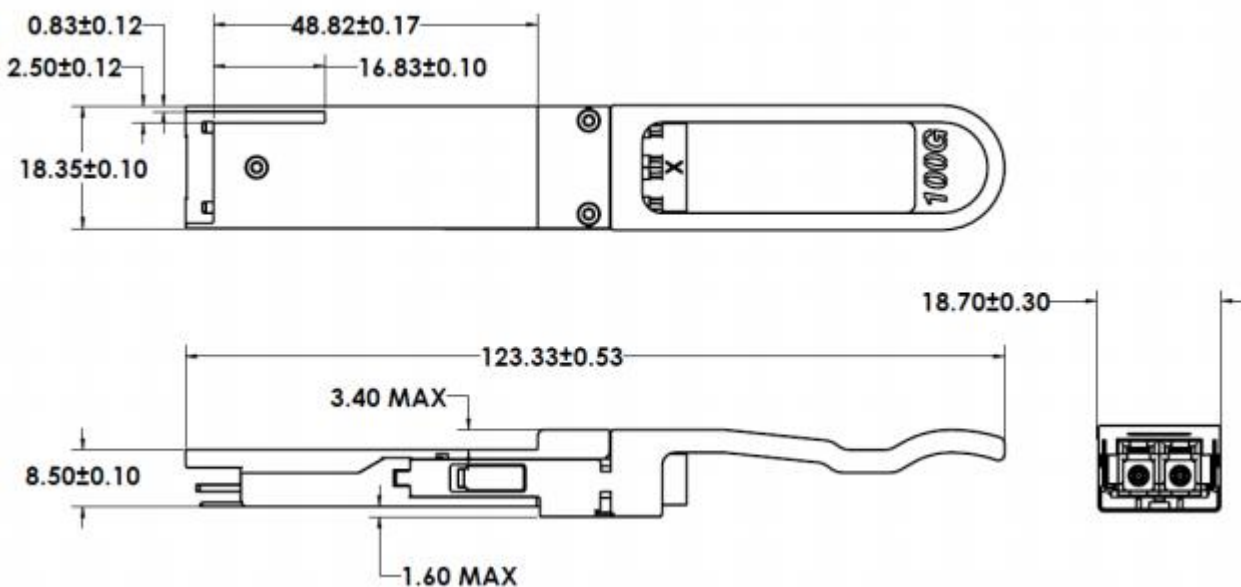
The QSFP28 transceivers support the I2C-based diagnostics interface specified by the QSFP28 MSA.

## ■ Memory Contents

Per the QSFP28 MSA.

## ■ Mechanical Specifications

Per the QSFP28 MSA.



Mechanical Dimensions

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