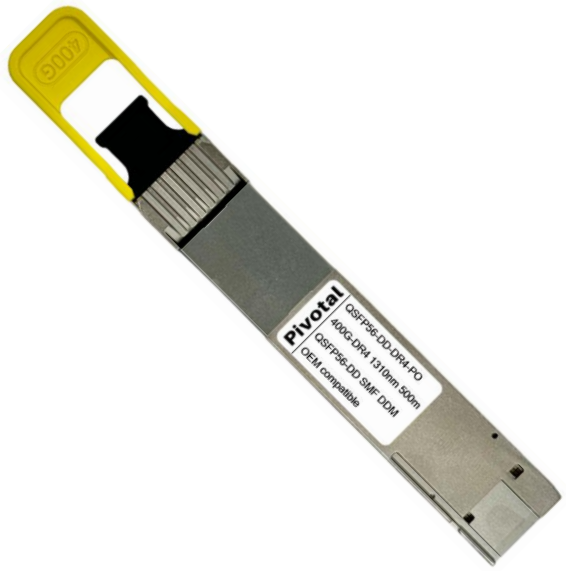
QSFP56-DD-DR4

400GBASE, QSFP-DD, DR4, SMF TRANSCEIVER

1310nm, 500m REACH, MPO-12 CONNECTOR

Product Features

- QSFP-DD MSA compliant
- MPO-12 connector
- Maximum power consumption 8W
- Operating case temperature: 0 to 70℃
- CMIS 4.0 management interface
- 400G DR4 Specification compliant
- Supports 425Gb/s aggregate bit rate
- Up to 500m transmission on single mode fiber with FEC
- Aggregation Mode:
- 400GBASE-DR4 compliant (4x 53.125GBd PAM4)
- 400GAUI-8 compliant (8x 26.5625GBd PAM4)
- Breakout Mode:
- 4x 100GBASE-DR compliant (53.125GBd PAM4)
- 100GAUI-2 compliant (2x 26.5625GBd PAM4)
- Case operating temperature:
  - Commercial: 0 ~ 70°C



Product Applications

- Data Centers
- 400GE to 4x 100GE breakout over 500m
- Switch/Router interconnections

I. Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently.

Parameter	Symbol	Min.	Typ.	Max.	Units
Storage Temperature	Ts	-40		+85	℃
Maximum Supply Voltage	Vcc	0		3.6	V
Optical Receiver Input (average, each lane)				5	dBm

II. Operating Specifications

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Operating Case Temperature	TOPR	0	25	70	ºC	
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Instantaneous peak current	Icc_ip_4			3200		
Sustained peak current	Icc_sp_4			2640.3		
Supply Current	Icc			2551.8		
Power dissipation	P			8		
Link Distance	Lmax			500	m	

III. Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Channel data rate			106.25		Gb/s	
Signaling rate			53.125±100ppm		GBd	PAM4
Optical Wavelength	λC	1304.5		1317.5	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power, each lane	AOPL	-2.9		4	dBm	1
Outer Optical Modulation Amplitude (OMAouter), each lane		-0.8		4.2	dBm	2
Launch power in OMAouter minus TDECQ, each lane		-2.2			dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	TDECQ			3.4	dB	
Average Launch Power of OFF Transmitter, each lane	TOFF			-15	dBm	
Extinction Ratio, each lane	ER	3.5			dB	
RIN15.6OMA	RIN			-136	dB/Hz	
Optical Return Loss Tolerance	ORL			21.4	dB	
Transmitter Reflectance	TR			-26	dB	3

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver						
Average Receive Power, each lane	AOPR	-5.9		4	dBm	4
Receive power (OMAouter), each lane				4.2	dBm	
Receiver reflectance				-26	dB	
Receiver sensitivity (OMAouter), each lane			Max (-3.9, SECQ-5.3)			5,6
Stressed receiver sensitivity(OMAouter), each lane				-1.9	dBm	5,7
Receiver Loss of Signal Indicator Assert Level		-15		-7.9	dBm	Average power
Receiver Loss of Signal Indicator De-assert Level				-7.4	dBm	Average power
Hysteresis		0.5			dB	
Conditions of Stressed Receiver Sensitivity						
Stressed eye closure for PAM4 (SECQ), lane under test		3.4			dB	
OMAouter of each aggressor lane		4.2			dBm	

Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Even if the TDECQ < 1.4 dB, the OMAouter (min) must exceed these values.
3. Transmitter reflectance is defined looking into the transmitter.
4. Average receive power, each lane (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
5. For when Pre-FEC BER is 2.4*10-4.
6. Receiver sensitivity (OMAouter), each lane (max) is informative and is defined for a transmitter with a value of SECQ up to 3.4 dB.
7. Measured with conformance test signal at TP3 (see IEEE Std 802.3-2022 clause 124.8.9) for the BER specified in IEEE Std 802.3-2022 124.1.1.
8. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

IV. Electrical Characteristics

Parameter	Min	Typical	Max	Unit	Notes
Transmitter					
Signaling rate per lane (range)		26.5625±100ppm		GBd	
AC Common-mode output voltage (RMS)			17.5	mV	
Differential peak-to-peak output voltage			900	mV	
Near-end ESMW (Eye symmetry mask width)	0.265			UI	
Near-end Eye height, differential	70			mV	
Far-end ESMW (Eye symmetry mask width)	0.2			UI	
Far-end Eye height, differential	30			mV	
Far-end pre-cursor ISI ratio	-4.5		2.5	%	
Differential output return loss	Equation (83E-2)			dB	1
Common to differential mode conversion return loss	Equation (83E-3)			dB	1
Differential termination mismatch			10	%	
Transition time (20% to 80%)	9.5			ps	
DC common mode voltage	-350		2850	mV	
Receiver					
Signaling rate per lane (range)		26.5625±100ppm		GBd	
Differential pk-pk input voltage tolerance	900			mV	
Differential input return loss	Equation (83E-5)			dB	1
Differential to common mode input return loss	Equation (83E-6)			dB	1
Differential termination mismatch			10	%	
ESMW (Eye symmetry mask width)	0.22			UI	
Eye width	0.22			UI	
Applied pk-pk sinusoidal jitter		Table 120E–6		MHz, UI	
Eye height	32			mV	
Single-ended input voltage tolerance range	-0.4		3.3	V	
DC common mode voltage	-350		2850	mV	

Notes:

1. IEEE Std 802.3-2022 Section 6

V. Ordering Information

Pivotal Part Number	Description
QSFP56-DD-DR4	QSFP56-DD, CMIS 4.0, 1310nm, DR4 SMF 500m, MPO 4x100G DDM, C-Temp

Notes:

1. Please contact sales for specific OEM Platform part numbers to fit your network.

Warranty
https://pivotaloptics.com/warranty/

Disclaimer
External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.