

QSFP56-DD-DR4+

400GBASE, QSFP-DD, DR4+, SMF TRANSCEIVER**1310nm, 2km REACH, MPO-12 CONNECTOR**

Product Features

- Supports 425Gbps
- Single 3.3V Power Supply
- Power dissipation < 10W
- Up to 2km over SMF
- RoHS compliant
- QSFP-DD MSA Compliant
- 8x53.125Gbps (PAM4) electrical interface
- MPO-12 connector
- PIN and TIA array on the receiver side
- I2C interface with integrated Digital Diagnostic
- Monitoring
- Safety Certification: TUV/UL/FDA*1
- Case operating temperature:
 - Commercial: 0 ~ 70°C



Product Applications

- 400G Ethernet
- 4 x 100G-FR1
- Infiniband interconnects

I. Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently.

Parameter	Symbol	Min.	Typ.	Max.	Units
Storage Temperature	Ts	-40		+85	°C
Supply Voltage	Vcc	-0.5		3.6	V
Relative Humidity (non-condensing)	RH	5		95	%
Control Input Voltage	VI	-0.3		Vcc+0.5	V

II. Operating Specifications

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Operating Case Temperature	TOPR	0		70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Instantaneous peak current at hot plug	ICC_IP			4000	mA	
Sustained peak current at hot plug	ICC_SP			3300	mA	
Maximum Power Dissipation	PD			10	W	
Maximum Power Dissipation, Low Power Mode	PDLP			1.5	W	
Signaling Rate per Lane	SRL		53.125		GBd	PAM4
Two Wire Serial Interface Clock Rate				400	kHz	
Power Supply Noise Tolerance (10Hz - 10MHz)				66	mV	
Rx Differential Data Output Load			100		Ohm	
Operating Distance		2		2000	m	

III. Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Wavelength	λ_C	1304.5	1311	1317.5	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power, each lane	AOPL	-3.1		4	dBm	1
Outer Optical Modulation Amplitude (OMA _{outer}), each lane	TOMA			4.2	dBm	
Outer Optical Modulation Amplitude (OMA _{outer}), each lane: - for TDECQ <1.4dB - for $1.4 \leq \text{TDECQ} \leq 3.4\text{dB}$	TOMA	-0.1 -1.5+ TDECQ			dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	TDECQ			3.4	dB	
Transmitter eye closure for PAM4(TECQ)	TECQ			3.4	dB	
TDECQ - TECQ				2.5	dB	
Over/under-shoot				22	%	
Transmitter power excursion				2	dBm	
Average Launch Power of OFF Transmitter, each lane	TOFF			-15	dBm	
Extinction Ratio, each lane	ER	3.5			dB	
RIN _{15.6OMA}	RIN			-136	dB/Hz	
Optical Return Loss Tolerance	ORL			17.1	dB	
Transmitter Reflectance	TR			-26	dB	
Transmitter Transition Time	Tt			17	ps	

Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength.

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Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver						
Wavelength	λ_C	1304.5	1311	1317.5	nm	
Damage Threshold, each lane	AOPD	5		-	dBm	
Average Receive Power, each lane	AOPR	-7.1		4	dBm	1
Receive Power (OMA _{outer}), each lane	OMAR			4.2	dBm	
Receiver Reflectance	RR			-26	dB	
Receiver Sensitivity (OMA _{outer}), each lane: - for TDECQ <1.4dB - for $1.4 \leq \text{TDECQ} \leq 3.4\text{dB}$	SOMA			-4.5 -5.9+ TECQ	dBm	
Stressed Receiver Sensitivity (OMA _{outer}), each lane	SRS			-2.5	dBm	2
Conditions of stressed receiver sensitivity test:						
Stressed eye closure for PAM4 (SECQ)			3.4		dB	

Notes:

1. Average receive power, (min) is informative and not the principal indicator of signal strength.
2. Measured with conformance test signal at TP3 for the BER = 2.4×10^{-4} .

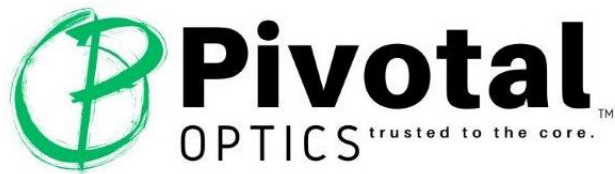
IV. Electrical Characteristics: High Speed Signals

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Differential pk-pk input Voltage tolerance		900			mV	
Differential termination mismatch				10	%	
Single-ended voltage tolerance range		-0.4		3.3	V	
DC common mode Voltage		-350		2850	mV	
Receiver						
AC common-mode output Voltage (RMS)				17.5	mV	
Differential output Voltage				900	mV	
Near-end Eye height, differential		70			mV	
Far-end Eye height, differential		30			mV	
Far end pre-cursor ratio		-4.5		2.5	%	
Differential Termination Mismatch				10	%	
Transition Time (min, 20% to 80%)		9.5			ps	
DC common mode Voltage		-350		2850	mV	
Low Speed Signals						
Module output SCL and SDA	VOL	0		0.4	V	
Module Input SCL and SDA	VIL	-0.3		V _{cc} *0.3	V	
	VIH	V _{cc} *0.7		V _{cc} +0.5	V	
InitMode, ResetL and ModSelL	VIL	-0.3		0.8	V	
	VIH	2		V _{cc} +0.3	V	
IntL	VOL	0		0.4	V	
	VOH	V _{cc} -0.5		V _{cc} +0.3	V	

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v. Ordering Information

Pivotal Part Number	Description
QSFP56-DD-DR4+	QSFP56-DD, CMIS 4.0, 1310nm, DR4 SMF 2km, 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.