QSFP56-DD-DR4

400G QSFP56-DD DR4 1310nm SMF 500m Transceiver

Product Features

- Supports 425Gbps
- Single 3.3V Power Supply
- Power dissipation < 10W
- Up to 500m over SMF
- QSFP-DD MSA Compliant
- 8x53.125GBd (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
- RoHS Compliant
- Case operating temperature:
  - Commercial: 0 ~ 70°C

Product Applications

- 4 x 100G-DR4
- Data Center

I. Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently.

Parameter	Symbol	Min.	Typ.	Max.	Units
Storage Temperature	Ts	-40		+85	℃
Power Supply Voltage	Vcc	-0.5		3.6	V
Damage Threshold	THd	5			dBm

II. Operating Specifications

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Case Operating Temperature	TC	0		+70	℃	Commercial
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Operating Relative Humidity	RH	5		85	%	
Power Dissipation	PD			10	W	

III. Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Signaling rate (each lane)			53.125		GBd	
Modulation format			PAM4			
Center wavelength	λC	1304.5	1311	1317.5	nm	
Side-mode Suppression Ratio	SMSR	30			dB	
Average launch power, each lane		-2.9		4		1
Extinction Ratio	ER	3.5			dB	
Transmit OMA each lane	TxOMA	-0.8		4.2	dBm	2
RIN21.4OMA				-136		
Average launch power of OFF transmitter, each lane				-15	dBm	
Transmitter and dispersion eye closure, each lane	TDECQ			3.4	dB	
Optical return loss tolerance				21.4	dB	
Transmitter Reflectance				-26	dB	3
Receiver						
Signaling rate (each lane)			53.125		GBd	
Damage Threshold, each lane		5			dBm	4
Modulation format			PAM4			
Center wavelength	λC	1304.5	1311	1317.5	nm	
Receive Power (OMA), each lane	RxOMA			4.2		
Average Receive Power (each lane)	RxAVG	-5.9		4	dBm	5
Receiver Sensitivity (OMAouter), each lane	SenOMA			-4.4		6
Receiver reflectance				-26	dB	
Stressed Receiver Sensitivity, (OMA outer) each lane						7
Conditions of Stressed Receiver Sensitivity Test:						
OMAouter of each aggressor lane			4.2		dBm	8
Stressed eye closure for PAM4 (SECQ), lane under test			3.4		dB	8
LOS Assert	LOSA	-15			dBm	8
LOS Deassert	LOSD			-10	dBm	8
LOS Hysteresis	LOSH	0.5			dB	8

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.Note9: Transmitter reflectance is defined looking into the transmitter.
3. Transmitter reflectance is defined looking into the transmitter.
4. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level. The receiver does not have to operate correctly at this input power.
5. 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.
6. Receiver sensitivity (OMAouter), each lane (max) is informative and is defined for a transmitter with SECQ of 0.9 dB.
7. Measured with conformance test signal at TP3 for the BER specified in IEEE Std 802.3bs clause 124.1.1.
8. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

IV. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Differential data input swing, per lane		900			mVpp	
Differential input impedance	Zin	90	100	110	Ohm	
Stressed input parameters						
Eye Width		0.265			UI	2
DC common mode voltage		-350		2850	mV	3
Receiver						
Differential output amplitude				900	mVpp	
Differential output impedance	Zout	90	100	110	Ohm	
Output Rise/Fall Time	tr/tf	9.5			ps	2
Eye Width		0.265			UI	
Eye height differential		70			mV	1

Notes:

1. With the exception to IEEE 802.3bs 120E.3.1.2 that the pattern is PRBS31Q or scrambled idle
2. @TP4, all 3 PAM4 eyes, 1E-5
3. DC common mode voltage is generated by the host. Specification includes effects of ground offset voltage.
4. 20% ~ 80%

Warranty

All transceivers feature a limited lifetime 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.