



HydraX MM Optical Transceiver Module

MPO QSFP28 100G SR4 850nm 100m OM4

Design Reference

IEEE 802.3bm
FCC Part 15 Class B
EN 55022:2010, Class B
EN 55024:2010
IEC 60825 Class 1

Application

100GBASE SR4 Proprietary
High Speed Interconnections
Data center

Working Condition

Operation Temperature
-0°C ~ +70°C (Case)
Storage Temperature
-40°C ~ +85°C (Ambient)
Relative humidity
5% ~ 95%

Compliance

CE Mark
FCC Mark

Safety and EMI

Protection of over
voltage/current



Four-channel full-duplex transceiver modules

Transmission data rate up to 25.78125Gbit/s per channel

Up to 70m on OM3 Multimode Fiber(MMF) and 100m on OM4 MMF

Low power consumption <2.5W

3.3V power supply voltage

Hot Pluggable QSFP28 form factor

MPO connector receptacle

Built-in digital diagnostic function

General Description

The Hermesys HydraX™ series SFP-22100001Q28X5DW 100G QSFP28 SR4 is a Four-Channel, Pluggable, Parallel, Fiber-Optic QSFP28 Transceiver for IEEE 802.3bm, 100GBASE SR4 Applications. The QSFP28 full-duplex optical module offers 4 independent transmit and receive channels, each capable of 25.78125Gbps operation for an aggregate data rate of 103.125Gbps 70m using OM3 fiber. These modules are designed to operate over multimode fiber systems using 850nm VCSEL laser array. An optical fiber ribbon cable with an MPO/MTPTM connector can be plugged into the QSFP28 module receptacle. QSFP28 SR4 is one kind of parallel transceiver which provides increased port density and total system cost savings.



Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	V_{CC}	-0.3		3.6	V	
Input Voltage	V_{in}	-0.3		$V_{CC}+0.3$	V	2

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Power Supply Voltage	V_{CC}	3.13	3.3	3.47	V	
Power Consumption		-		2.5	W	
Data Rate	D_R		25.78125		Gbps	
Data Speed Tolerance	ΔD_R	-100		+100	ppm	
Link Distance with OM3 fiber	D	0		70	m	OM4 MMF reach 100M

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Differential input impedance	Z_{in}	90	100	110	ohm	
Differential Output impedance	Z_{out}	90	100	110	ohm	
Differential input voltage amplitude	ΔV_{in}	300		1100	mVp-p	
Differential output voltage amplitude	ΔV_{out}	500		800	mVp-p	
Bit Error Rate	B_R			E-12		
Input Logic Level High	V_{IH}	2.0		V_{CC}	V	
Input Logic Level Low	V_{IL}	0		0.8	V	
Output Logic Level High	V_{OH}	$V_{CC}-0.5$		V_{CC}	V	
Output Logic Level Low	V_{OL}	0		0.4	V	

Optical Characteristics

Transmitter Optical Characteristics						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Center Wavelength	λ_C	840	850	860	nm	1
RMS Spectral Width	λ_{rms}	-		0.65	nm	1
Average Launch Power, each lane	PAVG	-8.4		+2.4	dBm	
Optical Modulation Amplitude (OMA)	POMA	-6.4		+3	dBm	1
Difference in Launch Power between any two lanes	$P_{tx,diff}$			4.0	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane	OMA-TDP			3.5	dBm	1
Extinction Ratio	ER	3.5			dB	



Transmitter Eye Mask Margin	EMM	10			%	2
Average Launch Power OFF Transmitter, each Lane	P _{off}			-30	dBm	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}	0.3, 0.38, 0.45, 0.35, 0.41, 0.5					

Receiver Optical Characteristics						
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Center Wavelength	λ_C	840	850	860	nm	
Damage Threshold	THd	3			dBm	
Overload, each lane	OVL	2.4			dBm	
Receiver Sensitivity in OMA, each Lane	S _{EN}			-5.2	dBm	
Signal Loss Assert Threshold	LOSA	-30			dBm	
Signal Loss Deassert Threshold	LOSD			-13	dBm	
LOS Hysteresis	LOSH	0.5		6	dB	
Optical Return Loss	ORL			-12	dBm	

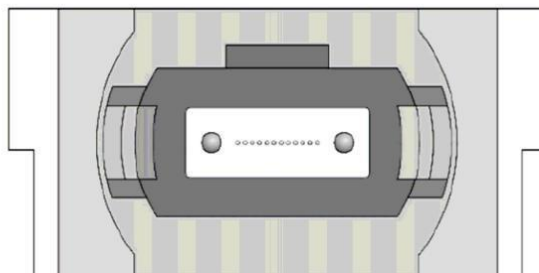
Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	3	degC	Over operating temp
Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	V	Full operating range
Channel RX power monitor absolute error	DMI_RX	-3	3	dB	Per channel
Channel Bias current monitor	DMI_ibias	-10%	10%	mA	Per channel
Temperature monitor absolute error	DMI_Temp	-3	3	degC	Over operating temp

Optical Interface Lanes and Assignment

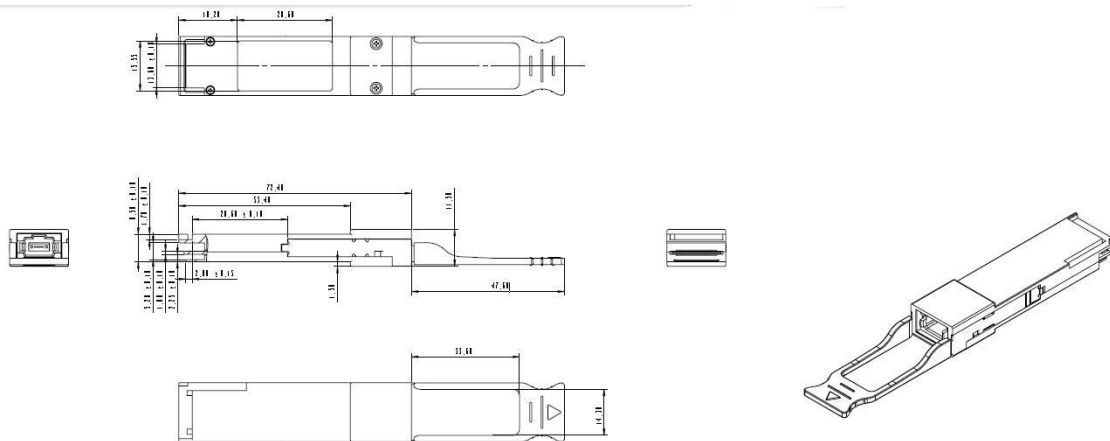
The optical interface port is a male MPO connector. The four fiber positions on the left as shown in Figure 2, with the key up, are used for the optical transmit signals (Channel 1 through 4). The fiber positions on the right are used for the optical receive signals (Channel 4 through 1). The central four fibers are physically present.



Transmit Channels: 1 2 3 4
 Unused positions: x x x x
 Receive Channels: 4 3 2 1



Dimension of Case



Order Information

Part Number	Grade	Packing info
SFP-22100001Q28X5DY	Commercial -0~70 °C	400 pcs per carton (10pcs per tray, 10 tray per inner box, 4 inner box per carton)

Note:

X means compatible equipment code.