

# SV-QSFP-100G-PLR4L

Starview QSFP28 100GBase aggregating 4 x 1310nm duplex SM (MPO-12) with DDM, distance up to 2km



## Features

- QSFP28 MSA compliant
- Compliant to IEEE 802.3bm 100GBASE PSM4
- Four independent full-duplex channels
- Supports 103.1Gb/s aggregate bit rate
- Up to 2km reach for G.652 SMF
- 4x25G electrical interface (OIF CEI-28G- VSR)
- Maximum power consumption 3.5W
- Single +3.3V power supply
- Operating case temperature: 0 to 70°C
- RoHS-6 compliant

## Applications

- 100G Ethernet links
- Infiniband QDR and DDR interconnects
- Datacenter and Enterprise networking

Part number	Description
<b>SV-QSFP-100G-PLR4L</b>	Starview QSFP28 100Gbps module 100GBase aggregating 4 x 1310nm duplex SM (MPO-12) with Digital Diagnostic Monitoring (DDM), distance up to 2km, supporting 100GE, Infiniband QDR, DDR and SDR

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Storage Temperature	T <sub>s</sub>	-40	85		°C
Operating Case Temperature	T <sub>OP</sub>	0	70		°C
Power Supply Voltage	V <sub>CC</sub>	-0.5	3.6		V
Relative Humidity (non-condensation)	RH	0	85		%
Damage Threshold, each Lane	TH <sub>d</sub>	3.0			dBm

## Recommended Operating Conditions and Power Supply Requirements

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Case Temperature	T <sub>OP</sub>	0		70	degC
Power Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V
Data Rate, each Lane			25.78125		Gb/s
Data Rate Accuracy		-100		100	ppm
Control Input Voltage High		2		V <sub>CC</sub>	V
Control Input Voltage Low		0		0.8	V
Link Distance with G.652	D	0.002		2	km

## Optical Characteristics

Parameter	Test Point	Min	Typical	Max	Units	Notes
Power Consumption				3.5	W	
Supply Current	I <sub>CC</sub>			1.06	A	
Transmitter (each Lane)						
Overload Differential Voltage pk-pk	TP1a	900			mV	
Common Mode Voltage (V <sub>cm</sub> )	TP1	-350		2850	mV	1
Differential Termination Resistance Mismatch	TP1			10	%	At 1MHz
Differential Return Loss (SDD11)	TP1			See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC11, SCD11)	TP1			See CEI-28G-VSR Equation 13-20	dB	

Stressed Input Test                      TP1a                      See CEI-28G-VSR Section 13.3.11.2.1

Receiver (each Lane)					
Differential Voltage, pk-pk	TP4		900	mV	
Common Mode Voltage (Vcm)	TP4	-350	2850	mV	1
Common Mode Noise, RMS	TP4		17.5	mV	
Differential Termination Resistance Mismatch	TP4		10	%	At 1MHz
Differential Return Loss (SDD22)	TP4		See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC22, SCD22)	TP4		See CEI-28G-VSR Equation 13-21	dB	
Common Mode Return Loss (SCC22)	TP4		-2	dB	2
Transition Time, 20 to 80%	TP4	9.5		ps	
Vertical Eye Closure (VEC)	TP4		5.5	dB	
Eye Width at 10-15 probability (EW15)	TP4	0.57		UI	
Eye Height at 10-15 probability (EH15)	TP4	228		mV	

Notes:

1. Vcm is generated by the host. Specification includes effects of ground offset voltage.
2. From 250MHz to 30GHz.

## Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Units	Notes
Transmitter						
Center Wavelength	$\lambda_c$	1295	1310	1325	nm	
Side Mode Suppression Ratio	SMSR	30			dB	

Total Average Launch Power	$P_T$		8.0	dBm	
Average Launch Power, each Lane	$P_{AVG}$	-5.5	2.0	dBm	
Optical Modulation Amplitude (OMA), each Lane	$P_{OMA}$	-3.5	2.2	dBm	1
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane		-4.3		dBm	
TDP, each Lane	TDP		2.9	dB	
Extinction Ratio	ER	3.5		dB	
Optical Return Loss Tolerance	TOL		20	dB	
Transmitter Reflectance	RT		-12	dB	
Average Launch Power OFF Transmitter, each Lane	$P_{off}$		-30	dBm	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}			
<b>Receiver</b>					
Center Wavelength	$\lambda_C$	1295	1310	1325	nm
Damage Threshold, each Lane	$TH_d$	3.0			dBm 2
Average Receive Power, each Lane		-10.2	2.0	dBm	
Receive Power (OMA), each Lane			2.2	dBm	
Receiver Sensitivity (OMA), each Lane	SEN1		-9.0	dBm	for BER = $1 \times 10^{-12}$
Stressed Receiver Sensitivity (OMA), each Lane			-6.44	dBm	for BER = $1 \times 10^{-12}$
Receiver Sensitivity (OMA), each Lane	SEN2		-11.35	dBm	for BER = $5 \times 10^{-5}$
Stressed Receiver Sensitivity (OMA), each Lane			-8.79	dBm	for BER = $5 \times 10^{-5}$
Receiver Reflectance	$R_R$		-26	dB	
LOS Assert	LOSA	-30		dBm	

LOS Deassert	LOSD	-15	dBm
LOS Hysteresis	LOSH	0.5	dB
Receiver Electrical 3 dB upper Cutoff Frequency, each Lane	Fc	31	GHz

**Conditions of Stress Receiver Sensitivity Test (Note 3)**

Vertical Eye Closure Penalty, each Lane	1.9	dB
Stressed Eye J2 Jitter, each Lane	0.27	UI
Stressed Eye J4 Jitter, each Lane	0.39	UI
Stressed Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}	{0.24, 0.5, 0.5, 0.24, 0.24, 0.4}	

Notes:

1. Even if the TDP < 0.8 dB, the OMA min must exceed the minimum value specified here.
2. The receiver shall be able to tolerate, without damage, continuous exposure to a modulated optical input signal having this power level on one lane. The receiver does not have to operate correctly at this input power.
3. Vertical eye closure penalty, stressed eye J2 jitter, stressed eye J4 jitter, and stressed receiver eye mask definition are test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

## Digital Diagnostic Functions

Parameter	Symbol	Min	Max	Units	Notes
Temperature monitor absolute error	DMI_Temp	-3	3	degC	Over operating temperature range
Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	V	Over full operating range
Channel RX power monitor absolute error	DMI_RX_Ch	-2	2	dB	1
Channel Bias current monitor	DMI_Ibias_Ch	-10%	10%	mA	
Channel TX power monitor absolute error	DMI_TX_Ch	-2	2	dB	1

Notes:

1. Due to measurement accuracy of different single mode fibers, there could be an additional +/- 1 dB fluctuation, or a +/- 3 dB total accuracy.