

# SV-QSFP-50G-LR1x

50GBase 1271nm TX/1331nm RX(1331nm TX/  
 1271nm RX) Single Lambda SM (LC) with  
 DDM, 10km



## Features

- QSFP28 MSA compliant
- Supports 26.56GBaud data rate
- IEEE802.3cd Specification compliant
- Up to 10km transmission on single mode fiber (SMF) with KP4 FEC
- Operating case temperature: 0°C to 70°C
- 50GAUI-2 electrical interface (OIF CEI- 28G-VSR)
- Maximum power consumption 4.5W
- Single LC Connector for bi-directional application
- RoHS compliant

## Applications

- Wireless application
- 50G Ethernet
- Enterprise networking

## Ordering Information

Part number	Description
<b>SV-QSFP-50G-LR11</b>	Starview QSFP28 Single Fiber Bi-Directional module supporting 50GBase 1271nm TX/ 1331nm RX Single Lambda SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 10km
<b>SV-QSFP-50G-LR12</b>	Starview QSFP28 Single Fiber Bi-Directional module supporting 50GBase 1331nm TX/ 1271nm RX Single Lambda SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 10km

## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units
Storage Temperature	TS	-40	85	degC
Operating Case Temperature	TOP	0	70	degC
Power Supply Voltage	VCC	-0.5	3.6	V
Relative Humidity (non-condensation)	RH	0	85	%
Damage Threshold, each Lane	THd	5.2		dBm

## Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Units	Notes
Operating Case Temperature	TOP	0		70	degC	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Electrical Data Rate, each Lane (NRZ)			26.562 5		Gb/s	
Optical Data Rate (PAM4)			26.562 5		GBd	
Data Rate Accuracy		-100		100	ppm	
Pre-FEC Bit Error Ratio				2.4x10 <sup>-4</sup>		
Post-FEC Bit Error Ratio				1x10 <sup>-12</sup>		1
Control Input Voltage High		2		Vcc	V	
Control Input Voltage Low		0		0.8	V	
Link Distance with G.652	D	0.002		10	km	

Notes:

1. FEC is provided by host.

## Electrical Characteristics

Parameter	Test Point	Min	Typical	Max	Units	Notes
Power Consumption				4.5	W	
Supply Current	Icc			1.36	A	
Transmitter (each Lane)						
Overload Differential Voltage pk-pk	TP1a	900			mV	
Common Mode Voltage (Vcm)	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 <sup>-15</sup> probability (EW15)	TP4	0.57		UI	
Eye Height at 10 <sup>-15</sup> 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	$\lambda_t$	1264.5	1271	1277.5	nm	SV-QSFP-50G-LR11
		1324.5	1331	1337.5		SV-QSFP-50G-LR12
Side Mode Suppression Ratio	SMSR	30			dB	
Spectral width				1	nm	
Average Launch Power	PAVG	-4.5		4.2	dBm	1
Outer Optical Modulation Amplitude (OMA <sub>outer</sub> )	POMA	-1.5		4	dBm	2
Launch Power in OMA <sub>outer</sub> minus Transmitter and Dispersion Eye Closure (TDECQ)		-2.9			dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ)	TDECQ			3.2	dB	
Extinction Ratio	ER	3.5			dB	
RIN <sub>15.6OMA</sub>	RIN			-132	dB/Hz	
Optical Return Loss Tolerance	TOL			15.6	dB	
Transmitter Reflectance	R <sub>T</sub>			-26	dB	
Average Launch Power OFF Transmitter	P <sub>off</sub>			-30	dBm	
Receiver						
Center Wavelength	$\lambda_r$	1264.5		1277.5	nm	SV-QSFP-50G-LR12
		1324.5		1337.5		SV-QSFP-50G-LR11
Damage Threshold	TH <sub>d</sub>	5.2			dBm	3
Average Receive Power		-10.8		4.2	dBm	
Receive Power (OMA <sub>outer</sub> )				4	dBm	

Receiver Sensitivity (OMA <sub>outer</sub> )	SEN	-8.9	dBm	for BER= 2.4x10 <sup>-4</sup>
Stressed Receiver Sensitivity (OMA <sub>outer</sub> )	SRS	-6.4	dBm	
Receiver Reflectance	RR	-26	dB	
LOS Assert	LOSA	-30	dBm	
LOS Deassert	LOSD	-11	dBm	
LOS Hysteresis	LOSH	0.5	dB	
Conditions of Stress Receiver Sensitivity Test (Note 4)				
Stressed Eye Closure for PAM4(SECQ)		3.2	dB	

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 < 1.4dB for an extinction ratio of ≥ 4.5dB or TDECQ < 1.3dB for an extinction ratio of < 4.5dB, the OMA<sub>outer</sub> (min) must exceed the minimum value specified here.
3. 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.
4. Stressed eye closure definition is test condition for measuring stressed receiver sensitivity. It is not a characteristic of the receiver.