

# SV-QSFP-50G-ER4x

50GBase 1295nm TX/1309nm RX(1309 nm TX/ 1295nm RX) Single Lambda SM (LC) with DDM, 40km



## Features

- QSFP28 MSA compliant
- Supports 26.56GBaud data rate
- IEEE802.3cd Specification compliant
- Up to 40km 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-ER41</b>	Starview QSFP28 Single Fiber Bi-Directional module supporting 50GBase 1295nm TX/ 1309nm RX Single Lambda SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 40km
<b>SV-QSFP-50G-ER42</b>	Starview QSFP28 Single Fiber Bi-Directional module supporting 50GBase 1309nm TX/ 1295nm RX Single Lambda SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 40km

## 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	0		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			40	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
<b>Transmitter</b>						
Center Wavelength	$\lambda_t$	1292.21	1295	1296.59	nm	SV-QSFP-50G-ER41
		1306.29	1309	1310.19		SV-QSFP-50G-ER42
Side Mode Suppression Ratio	SMSR	30			dB	
Spectral width				0.5	nm	
Average Launch Power	PAVG	0.4		6.6	dBm	1
Outer Optical Modulation Amplitude (OMA <sub>outer</sub> )	POMA	3.4		7.4	dBm	2
Launch Power in OMA <sub>outer</sub> minus Transmitter and Dispersion Eye Closure (TDECQ)		2			dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ)	TDECQ			3.2	dB	
Extinction Ratio	ER	6			dB	
RIN <sub>15,6OMA</sub>	RIN			-132	dB/Hz	
Optical Return Loss Tolerance	TOL			15	dB	
Transmitter Reflectance	RT			-26	dB	
Average Launch Power OFF Transmitter	P <sub>off</sub>			-15	dBm	
<b>Receiver</b>						
Center Wavelength	$\lambda_r$	1292.21		1296.59	nm	SV-QSFP-50G-ER42
		1306.29		1310.19		SV-QSFP-50G-ER41
Damage Threshold	TH <sub>d</sub>	-2.4			dBm	3
Average Receive Power		-17.6		-3.4	dBm	
Saturation Power	SP	-3.4			dBm	

Receive Power OMA			-2.6	dBm	
	SEN		max{-		for BER= 2.4x10 <sup>-4</sup>
Receiver Sensitivity (OMA <sub>outer</sub> )			15.1,SEC	dBm	
	RR		Q-16.5}		
Receiver Reflectance			-26	dB	
LOS Assert	LOSA	-30		dBm	
LOS Deassert	LOSD		-20	dBm	
LOS Hysteresis	LOSH	0.5		dB	
Stress Sensitivity OMA			-13.3	dBm	4

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. Test condition refer the standard of IEEE802.3cn-D3.0 Table139-7.