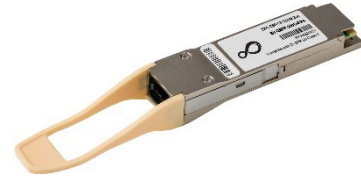


## SV-QSFP-200G-FR4

Starview QSFP56 200G-FR4 aggregating 4 x 50Gbps CWDM SM (LC) with DDM, distance up to 2km



### Features

- IEEE802.3bs 200GBASE-FR4 compliant
- QSFP56 MSA compliant
- 4 CWDM lanes MUX/DEMUX design
- Supports 212.5Gb/s aggregate bit rate
- Up to 2km transmission on single mode fiber (SMF) with FEC
- Operating case temperature: 0 to 70°C
- 200GAUI-4 electrical interface
- Maximum power consumption 5W
- LC duplex connector
- RoHS compliant

### Applications

- Data Center Interconnect
- 200G Ethernet
- Enterprise networking

### Ordering Information

Part number	Description
<b>SV-QSFP-200G-FR4</b>	Starview QSFP56 200Gbps module 200G-FR4 aggregating 4 x 50Gbps CWDM (1271/ 1291/ 1311/ 1331nm) SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 2km

## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
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	3.5		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	
Data Rate, each Lane			26.5625		GBd	
			53.125		Gb/s	
Data Rate Accuracy		-100		100	ppm	
Pre-FEC Bit Error Ratio				$2.4 \times 10^{-4}$		
Post-FEC Bit Error Ratio				$1 \times 10^{-12}$		1
Control Input Voltage High		2		Vcc	V	
Control Input Voltage Low		0		0.8	V	
Link Distance with G.652	D	0.002		2	km	2

Notes:

1. FEC provided by host system.
2. FEC required on host system to support maximum distance.

## Electrical Characteristics

Parameter	Test Point	Min	Typical	Max	Units	Notes
Power Consumption				5	W	
Supply Current	Icc			1.52	A	
Transmitter (each Lane)						
Signaling Rate, each Lane	TP1		$26.5625 \pm 100$ ppm		GBd	
Differential pk-pk Input Voltage Tolerance	TP1a	9			mVpp	1
		0				
		0				

Differential Termination Mismatch	TP1		10	%	
Differential Input Return Loss	TP1	IEEE 802.3-2015 Equation (83E-5)		dB	
Differential to Common Mode Input Return Loss	TP1	IEEE 802.3-2015 Equation (83E-6)		dB	
Module Stressed Input Test	TP1a	See IEEE 802.3bs 120E.3.4.1			2
Single-ended Voltage Tolerance Range (Min)	TP1a	-0.4 to 3.3		V	
DC Common Mode Input Voltage	TP1	-350	2850	mV	3
Receiver (each Lane)					
Signaling Rate, each lane	TP4	26.5625 ± 100 ppm		GBd	
Differential Peak-to-Peak	TP4		900	mVpp	
Output Voltage					
AC Common Mode Output Voltage, RMS	TP4		17.5	mV	
Differential Termination Mismatch	TP4		10	%	
Differential Output Return Loss	TP4	IEEE 802.3-2015 Equation (83E-2)			
Common to Differential Mode Conversion Return Loss	TP4	IEEE 802.3-2015 Equation (83E-3)			
Transition Time, 20% to 80%	TP4	9.5		ps	
Near-end Eye Symmetry Mask Width (ESMW)	TP4	0.265		UI	
Near-end Eye Height, Differential	TP4	70		mV	
Far-end Eye Symmetry Mask Width (ESMW)	TP4	0.2		UI	
Far-end Eye Height, Differential	TP4	30		mV	
Far-end Pre-cursor ISI Ratio	TP4	-4.5	2.5	%	
Common Mode Output Voltage (Vcm)	TP4	-350	2850	mV	3

Notes:

1. With the exception to IEEE 802.3bs 120E.3.1.2 that the pattern is PRBS31Q or scrambled idle.
2. Meets BER specified in IEEE 802.3bs 120E.1.1.
3. DC common mode voltage generated by the host. Specification includes effects of ground offset voltage.

## Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Units	Notes
Wavelength Assignment	L0	1264.5	1271	1277.5	nm	
	L1	1284.5	1291	1297.5	nm	
	L2	1304.5	1311	1317.5	nm	
	L3	1324.5	1331	1337.5	nm	
<b>Transmitter</b>						
Data Rate, each Lane		26.5625 ± 100 ppm			GBd	
Modulation Format		PAM4				
Side-mode Suppression Ratio	SMSR	30			dB	Modulated
Total Average Launch Power	P <sub>T</sub>			10.7	dB m	
Average Launch Power, each Lane	PAVG	-4.2		4.7	dB m	1
Outer Optical Modulation Amplitude (OMA <sub>outer</sub> ), each Lane	POMA	-1.2		4.5	dB m	2
Launch Power in OMA <sub>outer</sub> minus TDECQ, each Lane		-2.6			dB	For ER ≥4.5dB
		-2.5			dB	For ER <4.5dB
Transmitter and Dispersion Eye Clouser for PAM4, each Lane	TDEC Q			3.3	dB	
Extinction Ratio	ER	3.5			dB	
Difference in Launch Power between any Two Lanes (OMA <sub>outer</sub> )				4	dB	
RIN <sub>16.5OMA</sub>	RIN			-132	dB/ Hz	
Optical Return Loss Tolerance	TOL			16.5	dB	
Transmitter Reflectance	T <sub>R</sub>			-26	dB	
Average Launch Power of OFF Transmitter, each Lane	P <sub>off</sub>			-20	dB m	
<b>Receiver</b>						
Data Rate, each Lane		26.5625 ± 100 ppm			GBd	

Modulation Format		PAM4			
Damage Threshold, each Lane	TH <sub>d</sub>	5.7		dBm	3
Average Receive Power, each Lane		-8.2	4.7	dBm	4
Receive Power (OMA <sub>outer</sub> ), each Lane			4.5	dBm	
Difference in Receiver Power between any Two Lanes (OMA <sub>outer</sub> )			4.1	dB	
Receiver Sensitivity (OMA <sub>outer</sub> ), each Lane	SEN		-6.0	dBm	For BER of 2.4E-4
Stressed Receiver Sensitivity (OMA <sub>outer</sub> ), each Lane	SRS		-3.6	dBm	5
Receiver Reflectance	RR		-26	dB	
LOS Assert	LOSA	-30		dBm	
LOS De-assert	LOSD		-12	dBm	
LOS Hysteresis	LOSH	0.5		dB	
Stressed Conditions for Stress Receiver Sensitivity (Note 6)					
Stressed Eye Closure for PAM4 (SECQ), Lane under Test		0.9	3.4	dB	
OMA <sub>outer</sub> of each Aggressor Lane			1.5	dBm	

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 for an extinction ratio of ≥ 4.5 dB or TDECQ < 1.3 dB for an extinction ratio of < 4.5 dB, 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 an optical input signal having this average power level.
4. 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.
5. Measured with conformance test signal for BER = 2.4x10<sup>-4</sup>.
6. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.