

SV-QSFP-40G-LX4

40G Base aggregating 4 x CWDM 150m OM3 MM or 2km SM fiber (LC)



Features

- 4 CWDM lanes MUX/DEMUX design
- Up to 11.2Gb/s data rate per wavelength
- QSFP+ MSA compliant
- IEEE 802.3ba Electrical Interface
- Digital diagnostic capabilities
- Compliant with QDR/DDR Infiniband data rates
- Up to 150m transmission on OM3 multimode fiber (MMF) or 2km transmission on single mode fiber (SMF)
- Operating case temperature: 0 to 70°C
- Maximum power consumption 3.5W

Applications

- 40GBASE-LX4 Ethernet Links
- Infiniband QDR and DDR interconnects
- Client-side 40G datacom connections

Part number	Description
SV-QSFP-40G-LX4	Starview QSFP+ 40Gbps module 40GBase aggregating 4 x 10Gbps duplex CWDM (1271/ 1291/ 1311/ 1331nm) with Digital Diagnostic Monitoring (DDM), distance up to OM3 MM 150m or SM (LC) 2km, supporting 40GE

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Temperature	T _s	-40	85	°C	
Operating Case Temperature	T _{OP}	0	70	°C	
Power Supply Voltage	V _{CC}	-0.5	3.6	V	
Relative Humidity (non-condensation)	RH	0	85	%	
Damage Threshold, each Lane	TH _d	4.5		dBm	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	TOP	0		70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Data Rate, each Lane			10.3125	11.2	Gb/s	
Control Input Voltage High		2		V _{CC}	V	
Control Input Voltage Low		0		0.8	V	
Link Distance (OM3)	D _{MMF}			100	m	
Link Distance (SMF)	D _{SMF}			2	km	

Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Units	Notes
Power Consumption				3.5	W	
Supply Current	I _{CC}			1.1	A	
Transceiver Power-on Initialization Time				2000	ms	1

Transmitter (each Lane)

Single-ended Input Voltage Tolerance (Note 2)		-0.3		4.0	V	Referred to TP1 signal common
AC Common Mode Input Voltage Tolerance		15			mV	RMS
Differential Input Voltage Swing Threshold		50			mV _{pp}	LOSA Threshold
Differential Input Voltage Swing	V _{in,pp}	190		700	mV _{pp}	

Differential Input Impedance	Zin	90	100	110	Ohm	
Differential Input Return Loss		See IEEE 802.3ba 86A.4.11			dB	10MHz- 11.1GHz
J2 Jitter Tolerance	Jt2	0.17			UI	
J9 Jitter Tolerance	Jt9	0.29			UI	
Data Dependent Pulse Width Shrinkage (DDPWS) Tolerance		0.07			UI	
Eye Mask Coordinates {X1, X2 Y1, Y2}			0.11, 0.31 95, 350		UI mV	Hit Ratio = 5x10 ⁻⁵
Receiver (each Lane)						
Single-ended Output Voltage		-0.3		4.0	V	Referred to signal common
AC Common Mode Output Voltage				7.5	mV	RMS
Differential Output Voltage Swing	Vout,pp	300		850	mVpp	
Differential Output Impedance	Zout	90	100	110	Ohm	
Termination Mismatch at 1MHz				5	%	
Differential Output Return Loss		See IEEE 802.3ba 86A.4.2.1			dB	10MHz- 11.1GHz
Common Mode Output Return Loss		See IEEE 802.3ba 86A.4.2.2			dB	10MHz- 11.1GHz
Output Transition Time		28			ps	20% to 80%
J2 Jitter Output	Jo2			0.42	UI	
J9 Jitter Output	Jo9			0.65	UI	
Eye Mask Coordinates {X1, X2 Y1, Y2}			0.29, 0.5 150, 425		UI mV	Hit Ratio = 5x10 ⁻⁵

Notes:

1. Power-on initialization time is the time from when the power supply voltages reach and remain above the minimum recommended operating supply voltages to the time when the module is fully functional.
2. The single ended input voltage tolerance is the allowable range of the instantaneous input signals.

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	
Transmitter						
Total Average Launch Power	P_T			6.0	dBm	
Average Launch Power, each Lane (for SMF)	$P_{AVG,SMF}$	-7.0		0	dBm	
Average Launch Power, each Lane (for MMF)	$P_{AVG,MMF}$	-5.0		3.5	dBm	
OMA, each Lane (for SMF)	$P_{OMA,SMF}$	-6.0		1.0	dBm	1
OMA, each Lane (for MMF)	$P_{OMA,MMF}$	-4.0		4.5	dBm	
Difference in Launch Power between any Two Lanes (OMA)	$P_{Tx,diff}$			6.5	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane		-6.8			dBm	
TDP, each Lane	TDP			2.6	dB	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	12dB reflection
Transmitter Reflectance	R_T			-12	dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.23, 0.34, 0.43, 0.27, 0.35, 0.4}				
Average Launch Power OFF Transmitter, each Lane	P_{off}			-30	dBm	
Receiver						
Damage Threshold, each Lane	TH_d	4.5			dBm	2
Total Average Receive Power				6.0	dBm	
Average Receive Power, each Lane (for SMF)		-11.7		0	dBm	

Average Receive Power, each Lane (for MMF)		-7.0	3.5	dBm
Receiver Reflectance	R _R		-26	dB
Receive Power (OMA), each Lane (for SMF)			1.0	dBm
Receive Power (OMA), each Lane (for MMF)			4.5	dBm
Receiver Sensitivity (OMA), each Lane	SEN		-11.5	dBm
Difference in Receive Power between any Two Lanes (OMA)	Prx,diff		7.5	dB
LOS Assert	LOSA	-28		dBm
LOS Deassert	LOSD		-15	dBm
LOS Hysteresis	LOSH	0.5		dB
Receiver Electrical 3 dB upper Cutoff Frequency, each Lane	F _c		12.3	GHz

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.

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 multi-mode fibers, there could be an additional +/-1 dB fluctuation, or a +/- 3 dB total accuracy.