

SV-QSFP-40G-LR4L

40GBase aggregating 4 x duplex CWDM Lite(1270/ 1290/ 1310/ 1330nm) wavelengths SM (LC) with DDM, distance up to 2km



Features

- 4 CWDM lanes MUX/DEMUX design
- Up to 11.2Gb/s data rate per wavelength
- QSFP+ MSA compliant
- IEEE 802.3ba Electrical Interface
- Up to 2km transmission on single mode fiber (SMF)
- Operating case temperature: 0~70°C
- Maximum power consumption 3.5W
- LC duplex connector
- RoHS compliant

Applications

- Data Center Interconnect
- 40G Ethernet
- Infiniband QDR
- 40G Campus Link

Part number	Description
SV-QSFP-40G-LR4L	Starview QSFP+ 41.25Gbps module 40GBase aggregating 4 x duplex CWDM Lite(1270/ 1290/ 1310/ 1330nm) wavelengths SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 2km

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
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			2	km	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
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						
Side Mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	P _T			8.3	dBm	
Average Launch Power, each Lane	P _{AVG}	-7.0		2.3	dBm	
Optical Modulation Amplitude (OMA), each Lane	P _{OMA}	-6.0		3.5	dBm	1
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	OMA-TDP	-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
Optical Return Loss Tolerance	TOL		20	dB	
Transmitter Reflectance	R _t		-12	dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}					{0.25,0.4,0.45,0.25,0.28,0.4}
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			8.3	dBm	
Average Power at Receiver Input, each Lane		-11.7	2.3	dBm	
Receiver Reflectance	R _R		-26	dB	
Receive Power (OMA), each Lane			3.5	dBm	
Receiver Sensitivity (OMA), each Lane	SEN		-11.5	dBm	
Difference in Receive Power between any Two Lanes (OMA)			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			12.3	GHz	

Note(1): Even if the TDP < 0.8 dB, the OMA min must exceed the minimum value specified here.

Note(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 Diagnostics Functions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Temperature monitor absolute error	DML_Temp	-3		3	°C	Over operating temp
Supply voltage monitor absolute error	DML_VCC	-0.1		0.1	V	Full operating range
Channel RX power monitor absolute error	DML_RX_Ch	-2		2	dB	1
Channel Bias current monitor	DML_Ibias_Ch	-10%		10%	mA	Ch1~Ch4
Channel TX power monitor absolute error	DML_TX_Ch	-2		2	dB	1

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

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Power Consumption				3.5	W	
Supply Current	Icc			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 TPI signal common
AC Common Mode Input Voltage Tolerance (RMS)		15			mV	
Differential Input Voltage Swing Threshold		50			mVpp	LOSA Threshold
Differential Input Voltage Swing	Vin,pp	190		700	mVpp	
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 (RMS)				7.5	mV	
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

Note(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.

Note(2): The single ended input voltage tolerance is the allowable range of the instantaneous input signals