

SV-CFP4-100G-LR4F

100GBase aggregating 4 x duplex LWDM (1295.6 nm, 1300.1 nm, 1304.6 nm, and 1309.1nm) wavelengths SM (LC) with DDM, distance up to 10km with Forward Error Correction (FEC) supporting 100GE and OTU-4



Features

- Hot pluggable CFP4 MSA form factor
- Compliant to IEEE 802.3ba 100GBASE-LR4, ITU G.959.1, and CFP-MSA- HW-Specification
- Supports 103.1Gb/s and 112Gb/s aggregate bit rates
- Up to 10km reach for G.652 SMF
- Single +3.3V power supply
- Operating case temperature: 0-70°C
- Transmitter: cooled 4x28Gb/s LAN WDM EML TOSA (1295.56, 1300.05, 1304.58, 1309.14nm)
- Receiver: 4x28Gb/s PIN ROSA
- 4x28G electrical interface (OIF CEI-28G-VSR)
- MDIO management interface with digital diagnostic monitoring
- Power consumption less than 5.0W
- Duplex LC receptacle
- RoHS-6 compliant

Applications

- 100GBASE-LR4 100G Ethernet
- OTN OTU4 4I1-9D1F

Ordering Information

Part number	Description
SV-CFP4-100G-LR4F	Starview CFP4 100Gbps module 100GBase aggregating 4 x duplex LWDM (1295.6 nm, 1300.1 nm, 1304.6 nm, and 1309.1nm) wavelengths SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 10km with Forward Error Correction (FEC) supporting 100GE and OTU-4

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	T _s	-40		85	°C	
Relative Humidity (non-condensation)	RH			85	%	
Operating Case Temperature	T _{OP}	0		70	°C	
Supply Voltage	V _{CC}	-0.5		3.6	V	
Voltage on LVTTTL Input	V _{ilvttl}	-0.5		V _{CC} +0.3	V	
LVTTTL Output Current	I _{olvttl}			15	mA	
Voltage on Open Collector Output	V _{OCO}	0		6	V	
Damage Threshold, each Lane	TH _d	5.5			dBm	1

Note(1): PIN receiver

Recommended Operating Conditions and Supply Requirements

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	T _{OP}	0		70	degC	
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Data Rate, each Lane (100GE)					25.78125	
Data Rate Accuracy (100GE)		-100		100	ppm	
Data Rate, each Lane (OTU4)			27.95249		Gb/s	
Data Rate Accuracy (OTU4)		-20		20	ppm	
Control Input Voltage High		2		V _{CC}	V	
Control Input Voltage Low		0		0.8	V	
Power Supply Noise	V _{rip}			2	%	DC-1MHz
				3	%	1-10MHz
Link Distance with G.652	D	0.002		10	km	

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Power Consumption				5.0	W	
Supply Current	I _{CC}			1.51	A	
Low Power Mode Power Dissipation				2	W	
Transmitter (each Lane)						
Overload Differential Voltage pk-pk	TP1a	900			mV	
Common Mode Voltage (V _{cm})	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 ⁻¹⁵ probability (EW15)	TP4	0.57		UI	
Eye Height at 10 ⁻¹⁵ probability (EH15)	TP4	228		mV	

Note(1): Vcm is generated by the host. Specification includes effects of ground offset voltage.

Note(2): From 250MHz to 30GHz.

Optical Characteristics for ITU G.959.1 OTU4 4I1-9D1F

CFP4 OTU4 4I1-9D1F						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Data Rate, each Lane			27.95249		Gb/s	
Data Rate Accuracy		-20		20	ppm	
Lane Wavelength	L0	1294.53	1295.56	1296.59	nm	
	L1	1299.02	1300.05	1301.09	nm	
	L2	1303.54	1304.58	1305.63	nm	
	L3	1308.09	1309.14	1310.19	nm	
Transmitter						
SMSR	SMSR	30			dB	
Transmitter parameters for an optical output with ER > 4dB						
Total Average Launch Power	P _T			10	dBm	
Average Launch Power, each Lane	P _{AVG}	-0.6		4	dBm	
Extinction Ratio	ER	4		6.5	dB	
Transmitter parameters for an optical output with ER > 7dB						
Total Average Launch Power	P _T			8.9	dBm	
Average Launch Power, each Lane	P _{AVG}	-2.5		2.9	dBm	
Extinction Ratio	ER	7			dB	
Difference in Launch Power between any Two Lanes (Average)	P _{tx,diff}			5	dB	

Optical Return Loss	ORL	20		dB
Average Launch Power OFF Transmitter, each Lane	Poff		-30	dBm
Eye Mask {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}		1
Receiver				
Damage Threshold, each Lane	TH _d	5.5		dBm
Receiver parameters for an optical input with ER > 4dB				
Total Average Receive Power			10	dBm
Average Receive Power, each Lane		-6.9	4	dBm
Equivalent Sensitivity (Average), each Lane			-8.4	dBm
Receiver parameters for an optical input with ER > 7dB				
Total Average Receive Power			8.9	dBm
Average Receive Power, each Lane		-8.8	2.9	dBm
Equivalent Sensitivity (Average), each Lane			-10.3	dBm
Optical Path Penalty			1.5	dB
Receiver Reflectance	R _R		-26	dB
Difference in Receive Power between any Two Lanes (Average)	Prx,diff		5.5	dB
LOS Assert	LOSA		-18	dBm
LOS Deassert	LOSD		-15	dBm
LOS Hysteresis	LOSH	0.5		dB

Note(1): Hit ratio 5x10⁻⁵.

Note(2): Specified at a BER of 10⁻⁶ (pre-FEC), per ITU-T G.sup39.

Digital Diagnostic Functions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Temperature monitor absolute error	DMI_Temp	-3		3	°C	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	Ch1~Ch4
Channel TX power monitor absolute error	DMI_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