

# SV-SFPP28-25GLRD1

25Gbps, 1310nm, Single mode, 10km, with DDM



## Features

- Compliant to IEEE802.3by 25GBASE-LR
- Up to 25.78Gb/s data links
- 25G 1310nm DFB transmitter
- 25G PIN photo-detector
- 2-wire interface for management specifications compliant with SFF-8472 digital diagnostic monitoring interface for optical transceivers
- Operating case temperature: 0 to 70°C
- All-metal housing for superior EMI performance
- 25G electrical interface (OIF CEI-28G-VSR)
- Maximum power consumption 1.5W
- Advanced firmware allow customer system encryption information to be stored in transceiver
- RoHS compliant

## Applications

- High-speed storage area networks
- Computer cluster cross-connect
- Custom high-speed data pipes
- Inter Rack Connection

## Ordering Information

Part number	Description	TX Power (dBm)	RX Sens. (dBm)	Fiber Budget (dB)	Distance (km)	DDM
<b>SV-SFPP28-25GLRD1</b>	Starview SFP28+ module 25G 1310nm SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 10km	-7 to 2	-14 to -11.3	7	10	YES

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Storage Temperature	T <sub>s</sub>	-40		85	°C
Operating Case Temperature	T <sub>c</sub>	0		70	°C
Power Supply Voltage	V <sub>cc</sub>	0		3.6	V
Relative Humidity	RH	5		85	%
Damage Threshold	TH <sub>d</sub>	3.5			dBm

## Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	T <sub>c</sub>	0		70	°C	
Power Supply Voltage	V <sub>cc</sub>	3.135	3.3	3.465	V	
Data Rate, each Lane			25.78125		Gb/s	
Data Rate Accuracy		-100		100	ppm	
Control Input Voltage High		2		V <sub>cc</sub>	V	
Control Input Voltage Low		0		0.8	V	
Link Distance with G.652	D	0.002		10	km	

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Power Consumption				1.5	W	
Supply Current	I <sub>cc</sub>			450	mA	
Transmitter						
Overload Differential Voltage pk-pk	TP1a	900			mV	
Common Mode Voltage (V <sub>cm</sub> )	TP1	-350		2850	mV	1
Differential Termination Resistance Mismatch	TP1			10	%	At 1MHz
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					
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	

Note(1): Vcm is generated by the host. Specification includes effects of ground offset voltage.  
 Note(2): From 250MHz to 30GHz.

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Center Wavelength	$\lambda_t$	1295		1325	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Power	Pavg	-7		2	dBm	
OMA	POMA	-4		2.2	dBm	1
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP)		-5			dBm	
Transmitter Dispersion Penalty	TDP			2.7	dB	
Extinction Ratio	ER	3.5			dB	
Relative Intensity Noise	RIN20OMA			-130	dB/Hz	
Optical Return Loss Tolerance	TOL			20	dB	
Transmitter Reflectance	R <sub>T</sub>			-12	dB	
Average Launch Power OFF Transmitter	Poff			-30	dBm	
Eye Mask{X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				2

Receiver					
Center Wavelength	$\lambda_r$	1260	1350	nm	
Damage Threshold	$TH_d$	3.5		dBm	3
Average Receive Power		-13.3	2	dBm	
Receive Power (OMA)			2.2	dBm	
Receiver Sensitivity (OMA)	SEN		-11.3	dBm	for BER = $5 \times 10^{-5}$
Stressed Receiver Sensitivity (OMA)			-8.8	dBm	4
Receiver Reflectance	RR		-26	dB	
LOS Assert	LOSA	-30		dBm	
LOS Deassert	LOSD		-14	dBm	
LOS Hysteresis	LOSH	0.5		dB	
Receiver Electrical 3 dB upper Cutoff Frequency	Fc		31	GHz	
Stress Receiver Sensitivity Test Condition (note 5)					
Vertical Eye Closure Penalty ,each Lane	SEC		1.9	dB	
Stressed Eye J2 Jitter			0.27	UI	
Stressed Eye J4 Jitter			0.39	UI	
OMA of each Aggressor Lane			3	dBm	
Stressed Receiver Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3} - Hit ratio $1.5 \times 10^{-5}$ hits per sample			{0.24, 0.5, 0.5, 0.24, 0.24, 0.4}		

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

Note(2): Hit ratio  $5 \times 10^{-5}$  per sample.

Note(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.

Note(4): Measured with conformance test signal at receiver input for BER =  $5 \times 10^{-5}$ .

Note(5): Vertical eye closure penalty, stressed eye J2 jitter, stressed eye J4 jitter, and SRS eye mask definition are test conditions for measuring stressed receiver sensitivity. They are not the required characteristics of the receiver.

## Digital Diagnostic 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
RX power monitor absolute error	DML_RX	-2		2	dB	1
Bias current monitor	DML_Ibias	-10%		10%	mA	
Laser power monitor absolute error	DML_TX	-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.