

SV-SFPP-32GLRD1

32G SFP+ Fiber Channel 32G/16G/8G Low Voltage (3.3V)
1310nm SM (LC) with DDM, distance up to 10km



Features

- Compliant to RoHS directives
- 1310nm Distributed Feedback Laser (DFB)
- Class 1 eye safe per IEC60825-1 and CDRH
- Wide temperature range (0°C to 70°C)
- LC duplex connector optical interface conforming to ANSI TIA/EIA604-10 (FOCIS 10A)
- Diagnostic features per SFF-8472 "Diagnostic Monitoring Interface for Optical Transceivers"
- SFP+ mechanical specifications per SFF-8432
- Pull Tab delatch mechanism
- SFP+ compliant low speed interface
- Fibre Channel FC-PI-6 compliant high speed interface
- Fibre Channel FC-PI-6 compliant optical link distances

Applications

- Fibre Channel switches (director, stand alone, blade)
- Fibre Channel Host Bus Adapters
- Fibre Channel RAID controllers
- Fibre Channel tape drive
- Port side connections
- Inter-switch or inter-chassis aggregated links

Ordering Information

Part number	Description	TX Power (dBm)	RX Sens. (dBm)	Fiber Budget (dB)	Distance (km)	DDM
SV-SFPP-32GLRD1	Starview SFP+ Fiber Channel 32G/16G/8G Low Voltage (3.3V) 32G module 1310nm SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 10km	-5.0 to +2.0	-11 to +2.0	6	10	Yes

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units	Reference
Storage Temperature	T _S	-40	85	°C	Note 1
Case Operating Temperature	T _C	-40	85	°C	
Relative Humidity	RH	5	95	%	
Supply Voltage	V _{CC}	-0.5	3.6	V	
Low Speed Input Voltage	V _I	-0.5	V _{CC} +0.5, 3.6	V	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units	Reference
Case Operating Temperature	T _C	0		70	°C	Note 2
Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Data Rate		8.5		28.05	Gb/s	Note 3
Two Wire Serial (TWS) Interface Clock Rate				400	kHz	Note 4

Electrical Characteristics

Parameter	Symbols	Min.	Typ.	Max.	Units	Reference
Transceiver Power Consumption				1.2	W	
Power Supply Noise Tolerance (peak-peak)	PSNR			66	mVpp	Note 5
Low Speed Outputs:	vOH	2.0		V _{CC} T,R+0.3	V	Note 6
TX_FAULT, RX_LOS, MOD_DEF2	VOL			0.8	V	
Low Speed Inputs	VIH	2.0		V _{CC}	V	Note 7
TX_DIS, MOD_DEF1, MOD_DEF2, RS(0), RS(1)	VOL	0		0.8	V	

Notes:

1. Absolute maximum ratings are those values beyond which damage to the device may occur if these limits are exceeded for other than a short period of time. See Reliability Data Sheet for specific reliability performance. Between Absolute Maximum Ratings and the Recommended Operating Conditions functional performance is not intended, device reliability is not implied, and damage to the device may occur over an extended period of time.
2. The position of case temperature measurement is shown in Figure 5. Continuous operation at the maximum Recommended Operating Case Temperature should be avoided in order not to degrade reliability.
3. 32GFC requires FEC RS(528,514) encoding per FC-PI-6. 16GFC and 8GFC are not compatible with FEC, per FC-PI-5.
4. With 500us clock stretch per SFP+ MSA (INF-8431)
5. Filter per SFP specification is required on the host board to remove 10Hz to 2MHz content.
6. Pulled up externally with a 4.7k-10kΩ resistor on the host board to 3.3V
7. Mod_Def1 and Mod_Def2 must be pulled up externally with a 4.7k-10kΩ resistor on the host board to 3.3V

Transmitter and Receiver Electrical Characteristics

(T_c = 0°C to 70°C, V_{ccT}, V_{ccR} = 3.3V ± 5%)

Parameter	Symbol	Min.	Max.	Unit	Notes
High Speed Data Input Transmitter Differential Input Voltage (TD±)	V _I	50	900	mV	Note 1
High Speed Data Output Receiver Differential Output Voltage (RD±)	V _O	250	900	mV	Note 2
Module Electrical Input, Differential Termination Resistance Mismatch			10	%	
Module Electrical Input Differential return loss SDD11					See FC-PI-6 Equation 6-1, Figure 10
Module Electrical Input Common Mode to Differential Conversion, SCD11					See FC-PI-6 Equation 6-2, Figure 12
Module Electrical Input, Differential Mode to Common Conversion, SDC11					See FC-PI-6 Equation 6-2, Figure 12
Module Electrical Input, Stressed Input Random Jitter, p-p, 10E-6 BER			0.09	UI	
Module Electrical Input, Stressed Input Eye Width at 1E- 6 Probability EW6		0.46		UI	
Module Electrical Input, Stressed Input Eye Height at 1E-6 Probability EH6		50		mV	
Module Electrical Output, Common Mode Noise rms			17.5	mV,rms	
Module Electrical Output, Differential termination resistance mismatch			10	%	
Module Electrical Output, Differential return loss SDD22					See FC-PI-6 Equation 6-1, Figure 10
Module Electrical Output, Common Mode to Differential Conversion, SCD22					See FC-PI-6 Equation 6-3, Figure 12
Module Electrical Output, Differential Mode to Common Conversion, SDC22					See FC-PI-6 Equation 6-3, Figure 12
Module Electrical Output, Common Mode Return Loss, SCC22			-2	dB	
Module Electrical Output, Vertical Eye Closure			4	dB	
Module Electrical Output, Eye Width at 1E-6 Probability EW6		0.65		UI	
Module Electrical Output, Eye Height at 1E- 6 Probability EH12		250		mV	
Receiver Total Jitter (28.05Gb/s)	TJ			UI	Compliance Test. Note 3, 5
Receiver Total Jitter (14.025Gb/s)	TJ		0.36	UI	Note 3,
Receiver Total Jitter (8.5Gb/s)	TJ		0.71	UI	Note 4,
Receiver Deterministic Jitter (14.025Gb/s)	DJ		0.22	UI	Note 3,

Receiver Deterministic Jitter (8.5Gb/s)	DJ	0.42	UI	Note 4,
Receiver Data Dependent Pulse Width Shrinkage (14.025Gb/s)	DDPWS	0.14	UI	Note 3,
Receiver Data Dependent Pulse Width Shrinkage (8.5Gb/s)	DDPWS	0.36	UI	Note 4,

Notes:

1. Internally ac coupled and terminated (100Ω differential).
2. Internally ac coupled but requires an external load termination (100Ω differential).
3. CDR is engaged with 28.05Gb/s and 14.025 Gb/s.
4. CDR is not engaged with 8.5 Gb/s.
5. 32GFC (28.05Gb/s) assumes a FEC encoded RS(528, 514) signal and allows a BER of 1E-6 for receiver and transmitter measurements.

Transmitter Optical Characteristics

(Tc = 0°C to 70°C, VccT, VccR = 3.3V ± 5%)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Modulated Optical Output Power (OMA) (Peak to Peak) 28.05Gb/s	Tx,OMA	631			μW	
Modulated Optical Output Power (OMA) (Peak to Peak) 14.025Gb/s	Tx,OMA	631			μW	
Modulated Optical Output Power (OMA) (Peak to Peak) 8.5Gb/s	Tx,OMA	290			μW	
Average Optical Output Power 28.05Gb/s	Pout	-5.0		+2.0	dBm	Note 1
Average Optical Output Power 14.025Gb/s	Pout	-5.0			dBm	Note 1
Average Optical Output Power 8.5Gb/s	Pout	-8.4			dBm	Note 1
Center Wavelength	λc	1295		1325	nm	
Spectral Width – rms	σrms			1.0	nm	
RIN12 (OMA)	RIN			-130	dB/Hz	
Transmitter Distortion Penalty, 28.05Gb/s	TDP			2.7	dB	Note 2
Transmitter Distortion Penalty, 14.025Gb/s	TDP			4.4	dB	Note 2
Transmitter Distortion Penalty, 8.5Gb/s	TDP			3.2	dB	Note 3
Pout Tx_DISABLE Asserted	Poff			-35	dBm	

Notes:

1. Max Pout is the lesser of Class 1 safety limits (CDRH and EN 60825) or received power, max.
2. CDR is engaged with 28.05Gb/s and 14.025Gb/s.
3. CDR is not engaged with 8.5 Gb/s.

Receiver Optical and Electrical Characteristics

(Tc = 0°C to 70°C, VccT, VccR = 3.3V ± 5%)

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Optical Input Power, 28.05 Gb/s	PIN			+2.0	dBm,avg	
Optical Input Power, 14.025Gb/s	PIN			+2.0	dBm,avg	
Optical Input Power, 8.5Gb/s	PIN			+0.5		
Input Optical Modulation Amplitude, 28.05Gb/s (Peak to Peak) [Unstressed Sensitivity]	OMA	72			μW,OMA	Note 1, 2

Input Optical Modulation Amplitude, 14.025Gb/s (Peak to Peak) [Unstressed Sensitivity]	OMA	63	uW,OMA	Note 1
Input Optical Modulation Amplitude, 8.5Gb/s (Peak to Peak) [Unstressed Sensitivity]	OMA	42	uW,OMA	Note 1
Return Loss		26	dB	
Loss of Signal – Assert	Pa	-30	dBm,avg	
Loss of Signal – De-asserted	PD	-11	dBm,avg	
Loss of Signal – Hysteresis	PA – PD	0.5	dB	

Notes:

1. Max Pout is the lesser of Class 1 safety limits (CDRH and EN 60825) or received power, max.
2. 32GFC (28.05Gb/s) assumes a FEC encoded RS(528, 514) signal and allows a BER of 1E-6 for receiver and transmitter measurements.