SV-QSFP-400G-PFR1

Starview QSFP56-DD 400G-DR4+ aggregating 4 x 100Gbps 1310nm SM (MPO12 APC) with DDM, distance up to 2km

Features

- Supports 425Gbps
- Single 3.3V Power Supply
- Power dissipation < 10W
- Up to 2km over SMF
- RoHS compliant
- QSFP-DD MSA Compliant
- 8x53.125Gbps (PAM4) electrical interface
- MPO-12 connector
- Commercial case temperature range of 0°C to 70°C
- PIN and TIA array on the receiver side
- I2C interface with integrated Digital Diagnostic Monitoring
- Safety Certification: TUV/UL/FDA

Applications

- 4 x 100G-FR applications
- Data center
- Infiniband interconnects

Part number	Description
SV-QSFP-400G-PFR1	Starview QSFP56-DD 400Gbps module 400G-DR4+ aggregating 4 x 100Gbps 1310nm SM (MPO12 APC) with Digital Diagnostic Monitoring (DDM), distance up to 2km

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Ts	-40	+85	°C
Supply Voltage	Vcc	-0.5	3.6	V
Damage threshold	Rxdmg	5		dBm

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	Tc	0		70	°C
Power Supply Voltage	Vcc	3.135	3.3	3.465	V
Operating Relative Humidity	RH	5		85	%
Power Dissipation	P_D			10	W

* Power Supply specifications, Instantaneous, sustained and steady state current compliant with QSFP-DD MSA Power Classification.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
Differential data input swing per lane*(note5)		900			mV_{p-p}	
Differential input impedance	Zin	90	100	110	ohm	
Stressed input parameters						
Eye width		0.265			UI	@TP4, all 3 PAM4 eyes, 1E-5
DC common mode voltage*(note6)		-350		2850	mV	
Receiver						
Differential output amplitude				900	mV_{p-p}	
Differential output impedance	Zout	90	100	110	ohm	
Output Rise/Fall Time	t_r/t_f	9.5			ps	20%~80%
Eye width		0.265			UI	
Eye height differential		70			mV	@TP4, all 3 PAM4 eyes, 1E-5

Note5: With the exception to IEEE 802.3bs 120E.3.1.2 that the pattern is PRBS31Q or scrambled idle.

Note6: DC common mode voltage is generated by the host. Specification includes effects of ground offset voltage.

Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Signaling speed per lane			53.125		GBd
Modulation format			PAM4		
Center wavelength	λ_C	1304.5	1311	1317.5	nm
Side-mode Suppression Ratio	SMSR	30			dB
Average launch power, each lane*(note7)	TxAVG	-2.4		4	dBm
Outer Optical Modulation Amplitude (OMA_{outer}) *(note8)	TxOMA	-0.2		4.2	dBm
Launch power in OMA_{outer} minus TDECQ : for extinction ratio ≥ 4.5 dB for extinction ratio < 4.5 dB		 -1.6 -1.5			dBm
Transmitter and dispersion penalty eye closure for PAM4,each lane	TDECQ			3.4	dB
TDECQ—10*log10(Ceq) *(note14)				3.4	dB
Average launch power of OFF transmitter, each lane	TxOFF			-15	dBm
Extinction Ratio	ER	3.5			dB
Optical return loss tolerance				17.1	dB
Transmitter reflectance*(note9)				-26	dB
Transmitter transition time				17	ps
$RIN_{17.1}OMA$				-136	dB/Hz
Receiver					
Signaling speed per lane			53.125		GBd
Center wavelength	λ_C	1304.5	1311	1317.5	nm
Damage threshold each lane*(note10)		5.5			dBm
Average receive power each lane*(note11)	RxAVG	-6.4		4	dBm
Receive Power (OMA_{outer}) each lane	RxOMA			4.7	dBm
Receiver reflectance				-26	dB
Receiver sensitivity (OMAouter), each lane*(note12)	SenOMA			Max (-4.5, SECQ5.9)	dBm
Stressed Receiver sensitivity (OMAouter) each lane *(note13)				-2.5	dBm
Conditions of stressed receiver sensitivity test: *(note14)					
Stressed eye closure for PAM4 (SECQ), lane under test	SECQ		3.4		dB
SECQ—10*log10(Ceq) *(note14)				3.4	dB
LOS Assert	LOSA	-15			dBm
LOS De-Assert	LOSD			-10	dBm

LOS Hysteresis	0.5	5	dB

Note7: Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.

Note8: Even if the TDECQ < 1.4 dB for an extinction ratio of ≥ 4.5 dB or TDECQ < 1.3 dB for an extinction ratio of

< 4.5 dB, the OMAouter (min) must exceed this value.

Note9: Transmitter reflectance is defined looking into the transmitter.

Note10: The receiver shall be able to tolerate, without damage, continuous exposure to an optical signal having this average power level. The receiver does not have to operate correctly at this input power.

Note11: Average receive power, (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.

Note12: Receiver sensitivity (OMAouter), (max) is informative and is defined for a transmitter with a value of SECQ up to 3.4 dB.

Note13: Measured with conformance test signal at TP3 for the BER specified in IEEE Std 802.3cd clause 140.1.1.

Note14: Ceq is a coefficient defined in IEEE Std 802.3-2018 clause 121.8.5.3 which accounts for reference equalizer noise enhancement.