

SV-QSFP-400G-ER4N

Starview QSFP56-DD 400Gbps module
 400G-ER4 narrow LWDM SM (LC) with
 DDM, distance up to 40km



Features

- Supports 400GBASE-ER4;
- Lane bit rate 106.25 Gb/s with PAM4;
- Up to 40km transmission on SMF;
- Narrow LANWDM laser and PIN receiver;
- 8x53.125Gb/s with PAM4 electrical interface (400GAUI-8);
- I2C interface with integrated Digital Diagnostic monitoring;
- QSFP-DD MSA package with duplex LC connector;
- Single +3.3V power supply;
- Maximum power consumption 10 W;
- Operating case temperature: 0 to +70 °C;
- Compliant to QSFP-DD CMIS standard;
- Compliant to QSFP-DD Hardware Specification;
- Complies with EU Directive 2015/863/EU;

Applications

- 400GBASE-ER4

Part number	Description
SV-QSFP-400G-ER4N	Starview QSFP56-DD 400Gbps module 400G-ER4 aggregating 4 x 100Gbps narrow LWDM (1304.58nm,1306.85nm,1309.14nm,1311.43nm) SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 40km

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	TS	-40	-	+85	°C	
Supply Voltage	VCC	-0.5	-	+3.6	V	
Operating Relative Humidity	RH	5	-	+85	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	TC	0	-	+70	°C	
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC	-	-	3.19	A	3.13V
Maximum Power Dissipation	PD	-	-	10	W	
Aggregate Bit Rate	BRAVE	-	425	-	Gb/s	With PAM4
Lane Bit Rate	BRLANE	-	106.25	-	Gb/s	With PAM4
Transmission Distance	TD	-	-	40	km	Over SMF

Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Center Wavelength Lane 0	λ_0	1304.06	1304.58	1305.1	nm	
Center Wavelength Lane 1	λ_1	1306.33	1306.85	1307.38	nm	
Center Wavelength Lane 2	λ_2	1308.61	1309.14	1309.66	nm	
Center Wavelength Lane 3	λ_3	1310.9	1311.43	1311.96	nm	
Average Launch Power per Lane	PTX_LANE	1.5	-	7.1	dBm	1,3
OMA _{outer} per Lane	OMA _{outer}	4.5	-	7.9	dBm	
Transmitter eye closure for PAM4 (TECQ), each lane	TECQ	-	-	3.9	dB	
Average Output Power (Laser Turn off)	POUT-OFF	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	6	-	-	dB	
Receiver						
Center Wavelength Lane 0	λ_0	1304.06	1304.58	1305.1	nm	
Center Wavelength Lane 1	λ_1	1306.33	1306.85	1307.38	nm	
Center Wavelength Lane 2	λ_2	1308.61	1309.14	1309.66	nm	
Center Wavelength Lane 3	λ_3	1310.9	1311.43	1311.96	nm	
Damage threshold, per lane	P _{damage}	-2.4	-	-	dBm	2

Average Rx Power per Lane	PRx_LANE	-16.2	-	-3.4	dBm	3
Receiver sensitivity (OMAouter), per lane	Sens_OMA	-	-	-14	dBm	4
Los Assert	LOSA	-30	-	-	dBm	
Los De-assert	LOSD	-	-	-17	dBm	
Los Hysteresis	LOSH	0.5	-	-	dB	

Notes:

1. The optical power is launched into SMF.
2. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level. The receiver does not have to operate correctly at this input power.
3. Average receive power, each lane (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.
4. Receiver sensitivity (OMAouter), each lane (max) is defined with BER=2.4E-4.

Electrical Characteristics

High-Speed Signal: Compliant to 400GAUI-8 (IEEE 802.3bs)

Low-Speed Signal: Compliant to QSFP-DD Hardware Specification

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter (Module Input)						
Differential Data Input Amplitude	V _{IN,P-P}	900	-	-	mVpp	
Differential Termination Mismatch		-	-	10	%	
Receiver (Module Output)						
Differential Data Output Amplitude	V _{OUT,P-P}	-	-	900	mVpp	
Differential Termination Mismatch (1MHZ)		-	-	10	%	
Low-speed Electrical Interface						
LPMoDe/TxDis, ResetL,	V _{IL}	-0.3	-	0.8	V	
ModSelL and ePPS/Clock	V _{IH}	2.0	-	VCC+0.3	V	
ModPrsL	V _{OL}	0	-	0.4	V	
	V _{IH}	ModPrsL can be implemented as a short-circuit to GND on the module				
IntL	V _{OL}	0	-	0.4	V	
	V _{OH}	VCC-0.5	-	VCC+0.3	V	

Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	°C	Internal

Voltage	3.13 to 3.47	±3%	V	Internal
Tx Bias Current per lane	0 to 110	±10%	mA	Internal
Tx Output Power per lane	1.5 to 7.1	±3	dB	Internal
Rx Input Power per lane	-16.2 to -3.4	±3	dB	Internal
