

SV-QSFP-400G-HZR+

Starview QSFP56-DD Single-rate 400G DCO module, Full C-Band tuneable High Tx Power 400G-ZR+ oFEC SM (LC) with DDM, distance up to 120km



Features

- Support Flex-grid channel spacing DWDM in C-band
- Support Client-side Interfaces: 1*400GAUI-8 for 400G ZR, 1*400GAUI-8/4*100GAUI-2 for 400G OpenZR+
- Support Line-side: DP-16QAM with CFEC(ZR), DP-16QAM with oFEC (OpenZR+)
- High TX Power up to +3dBm
- Integrated TOF is optional
- 76pin QSFP-DD MSA compliant connector
- Compliant to CMIS 5.0
- Compliant to OIF Implementation Agreement for Coherent CMIS, Rev 01.1
- OIF-400ZR-02.0
- OIF OpenZRplus_2p0
- RoHS compliant
- High-quality BOX packaging

Part number

Description

SV-QSFP-400G-HZR+
(Single-Rate)

Starview QSFP56-DD Single-Rate 400G DCO module, Full C-Band tuneable High Tx Power 400G-ZR+ oFEC SM (LC) with Digital Diagnostic Monitoring (DDM), distance up to 120km, support 400GAUI-8 / 4x100GUI-2

Absolute Maximum Ratings

Parameter	Min	Max	Unit	Note
Storage Temperature	-40	85	°C	
Storage Humidity (Relative)	-	85	%	no-Condensing
Case Temperature	0	75	°C	
Operating Humidity (Relative)	-	85	%	no-Condensing
Short term Operating Case Temperature		80	°C	<24 hours
Power Supply Absolute Range	-0.3	3.63	V	
RX Optical Maximum Input Power	-	10	dBm	

Operating Environments

Parameter	Min	Max	Unit	Note
Operating Case Temperature	0	70	°C	
Operating Humidity (Relative)	-	85	%	no-Condensing
Power Supply Operating Range	3.135	3.465	V	
RX Optical Input Power	-	0	dBm	

Electrical Specifications

Parameter	Min	Typ.	Max	Unit
3.3V DC Power Supply Voltage	3.135	3.3	3.465	V
3.3V DC Power Supply Current			8	A
Power Dissipation@400G ZR		16	18	W
Power Dissipation@400G OpenZR+		17	21.5	W
Low Power Consumption			1.5	W
Module Inrush Current			100	mA/us
Turn-off Current	-100			mA/us
Power Supply Noise			25	mV

Low Speed Control and Sense Signals

Parameter	Symbol	Min	Max	Unit	Condition
SCL and SDA	VOL	0	0.4	V	IOL(max)=3 mA for fast mode, 20 mA for Fast-mode plus
SCL and SDA	VIL	-0.3	Vcc * 0.3	V	
	VIH	Vcc * 0.7	Vcc + 0.5	V	
Capacitance for SCL and SDA I/O signal	Ci		14	pF	
Total bus capacitive load for SCL and SDA	Cb		100	pF	For 400 kHz clock rate use 3.0k Ohms Pull-up resistor, max.
			200	pF	For 400 kHz clock rate use 1.6k Ohms Pull-up resistor, max.
LPMode, ResetL, ModSelL and ePPS	VIL	-0.3	0.8	V	
	VIH	2	Vcc + 0.3	V	
LPMode, ResetL and ModSelL	Iin		360	uA	0V<Vin<Vcc
ePPS	Iin		TBD	uA	0V<Vin<Vcc
IntL	VOL	0	0.4	V	IOL=2.0 mA
	VOH	Vcc – 0.5	Vcc + 0.3	V	10k Ohms pull-up to Host Vcc
ModPrsL	VOL	0	0.4	V	IOL=2.0 mA
	VOH			V	ModPrsL can be implemented as a short-circuit to GND on the module

Electrical Characteristics for Transmitter

Parameter	Min	Typ.	Max	Unit	Note
Signal Rate, each Lane		26.5625±100ppm		GBaud	
Differential Peak-Peak Input Voltage Tolerance			900	mVpp	

Electrical Characteristics for Receiver

Parameter	Min	Typ.	Max	Unit	Note
Signal Rate, each Lane		26.5625±100ppm		GBaud	
Differential Peak-Peak Input Voltage Tolerance		750	900	mVpp	
Transition Time, 20% to 80%		9.5		ps	

Optical Transmitter Specifications (100G to 400G Payload)

Parameter	Min	Typ.	Max	Unit	Notes
Transmitter Frequency Range	191.3	193.7	196.1	THz	C band 75GHz ITU-T grid. Frequency range over which the specifications hold unless noted otherwise.
Laser Frequency Stability	-1.8		1.8	GHz	Frequency stability relative to ITU grid.
Laser Frequency Accuracy	-1.8		1.8	GHz	
Laser Frequency Fine Tuning Range	-6.0		6.0	GHz	
Fine Tuning Resolution		100		MHz	
Channel Tuning Speed	-		60	s	
Laser LineWidth			100	kHz	
Transmitter Output Power Range	-5		+3	dBm	
Transmitter Output Disable Time			180	ms	
Output Power Stability	-0.5		0.5	dB	Difference over temperature, time, wavelength and aging.
Output Power Accuracy	-2		2	dB	Difference between the set value and actual value over aging.
Transmitter Turn-up Time from Cold Start	-		120	s	
Transmitter OSNR (Inband)	34		-	dB/0.1nm	
Transmitter OSNR (Out-of-band)	TBD		-	dB/0.1nm	Spec for CTFQDS400SZPTA00, TOF version
Transmitter Back Reflectance	-		-24	dB	
Transmitter Output Power with TX Disabled	-		-20	dBm	
Transmitter Polarization Dependent Power	-		1.5	dB	Power deference between X and Y polarization

Optical Receiver Specifications @ 400G ZR

Parameter	Min	Typ.	Max	Unit	Notes
Receiver Frequency Range	191.3	193.7	196.1	THz	
Input Power Range	-12		0	dBm	Signal power of the channel at the OSNR Penalty < 0.5dB
OSNR Sensitivity		24	26	dB/0.1nm	
Receiver Sensitivity			-24	dBm	Input power needed to achieve post FEC BER < 1E-15 when OSNR Tolerance > 26dB/0.1nm
CD Tolerance	2400			ps/nm	Tolerance to CD with 0.5 dB penalty to OSNR sensitivity when change in SOP is 1 rad/ms.
PMD Tolerance	10			ps	Tolerance to PMD with < 0.5 dB penalty to OSNR sensitivity.
Peak PDL Tolerance	3.5			dB	Tolerance to peak PDL with < 1.8 dB penalty to OSNR sensitivity when change in SOP is < =1 rad/ms.
Tolerance to Change in SOP	50		-	rad/ms	
Input Power Transient Tolerance	-2		2	dB	Tolerance to change in input power with < 0.5 dB penalty to OSNR sensitivity.
Input Power Reading Accuracy	-2		2	dB	
Optical Return Loss	20			dB	Optical reflectance at Rx connector input.
Receiver Turn-up Time from Cold Start	-		120	s	From module reset, with valid optical input signal present.

Optical Receiver Specifications for 400G OpenZR+ (100G to 400G Payload)

Parameter	Min	Typ.	Max	Unit	Notes
Receiver Frequency Range	191.3	193.7	196.1	THz	
Input Power Range	-12		0	dBm	Signal power of the channel at the OSNR Penalty < 0.5Db
OSNR Sensitivity		22	24	dB/0.1nm	
Receiver Sensitivity			-20	dBm	Input power needed to achieve post FEC BER < 1E-15 when OSNR Tolerance > 26dB/0.1nm
CD Tolerance	9000			ps/nm	Tolerance to CD with 0.5 dB penalty to OSNR sensitivity when change in SOP is 1 rad/ms.
PMD Tolerance	20			ps	Tolerance to PMD with < 0.5 dB penalty to OSNR sensitivity.

Peak PDL Tolerance	3.5			dB	Tolerance to peak PDL with < 1.8 dB penalty to OSNR sensitivity when change in SOP is < =1 rad/ms.
Tolerance to Change in SOP	50	-		rad/ms	
Input Power Transient Tolerance	-2	2		dB	Tolerance to change in input power with < 0.5 dB penalty to OSNR sensitivity.
Input Power Reading Accuracy	-2	2		dB	
Optical Return Loss	20			dB	Optical reflectance at Rx connector input.
Receiver Turn-up Time from Cold Start	-	120		s	From module reset, with valid optical input signal present.
Baud Rate - 400G	59.843750000±20ppm			GBd	400ZR,SFF-8024MediaID 3Eh/3Fh
	60.138546798±20ppm			GBd	400ZR+,SFF-8024 Media ID 46h
Baud Rate - 300G	60.138546798±20ppm			GBd	300ZR+,SFF-8024 Media ID 47h
Baud Rate - 200G	60.138546798±20ppm			GBd	200ZR+,SFF-8024 Media ID 48h
Baud Rate - 100G	30.069273399±20ppm			GBd	100ZR+,SFF-8024 Media ID 49h
Input Power Range - 400G	-12	0		dBm	Signal power, OSNR>26dB,400ZR
	-12	0		dBm	Signalpower,OSNR>24dB, 400ZR+
	-21	0		dBm	400G Gray Light ,OSNR>34dB
Input Power Range - 300G	-15	0		dBm	Signalpower, OSNR>21dB,300ZR+
Input Power Range - 200G	-18	0		dBm	Signalpower, OSNR>16dB,200ZR+
Input Power Range - 100G	-18	0		dBm	Signalpower, OSNR>12.5dB,100ZR+
OSNR Tolerance - 400G		26		dB/0.1nm	400ZR Measured back-to- backwith short optical channel
		24		dB/0.1nm	400ZR+ Measured back-to- backwith short optical channel
OSNR Tolerance - 300G		21		dB/0.1nm	300ZR+ Measured back-to- backwith short optical channel
OSNR Tolerance - 200G		16		dB/0.1nm	200ZR+ Measured back-to- backwith short optical channel
OSNR Tolerance - 100G		12.5		dB/0.1nm	100ZR+ Measured back-to- backwith short optical channel
Optical Rx_LOS Assert Threshold - 400G	-20	-18	-16	dBm	
Optical Rx_LOS Assert Threshold - 400G Gray Light	-28	-26	-24	dBm	

Optical Rx_LOS				
Assert Threshold -				
300G	-23	-21	-19	dBm
Optical Rx_LOS				
Assert Threshold -				
200G	-26	-24	-22	dBm
Optical Rx_LOS				
Assert Threshold -				
100G	-26	-24	-22	dBm