Optical Transceiver: 400G QSFP-DD ZR+ DCO PRO(+1dBm)

3C-QSFPD4-DCO-PZR

The 400G QSFP-DD ZR+ DCO PRO Optical Transceiver (High TX Power +1dBm) is a high performance, high output power, cost-effective module for optical data communication applications from 100G to 400G. The 400G QSFP-DD ZR+ high power (+1dBm) is designed to 100G/200G long-haul and 300G/400G Metro IP over DWDM applications without inline chromatic dispersion compensation.

The 400G QSFP-DD ZR+ high power (+1dBm) is a C-Band optical frequency tunable coherent optical module, combines 7nm coherent DSP ASIC functionality with best in class ultra-narrow line-width tunable lasers, high speed modulators and high responsively coherent receivers to deliver high performance at 100G DP-QPSK/ 200G DP-QPSK / 300G DP-8QAM / 400G DP-16QAM modulation format. With EDFA and VOA inside the TX optical path the output optical power is -10~1dBm tunable, at the 400G Gray Light mode (193.7THz) the output power is 4dBm.

The 400G QSFP-DD ZR+ high power(+1dBm) coherent transceiver is compliant with the OIF QSFP-DD MSA. Digital diagnostics functions are available via an I2C interface as specified by the QSFP-DD MSA. Mechanical dimensions, connectors and footprint conform to QSFP-DD MSA. The module is 18.35mm x 93.26mm x 8.50mm in size and hot pluggable by 76 PIN PAD and host connector.

Product features

- Compliant with QSFP-DD MSA, Type 2B package
- Compliant with Open ZR+ MSA and OIF 400ZR MSA, support OFEC and CFEC FEC
- Line rate 100G/200G/300G/400G
- Client rate 1/2/3/4x100GbE or 1x400GbE
- C-band tunable, supports 100/75/50GHz grid spacing, support 0.1GHz fine turning
- EDFA inside, High output Power, max TX power +4dBm at 193.7THz, +1dBm at C-band
- TX VOA inside, output power -10~1dBm tunable
- Support ingress LF hold-off time configure
- Support hitless firmware upgrade
- Compact size (18.35 mm x 93.26 mm x 8.50 mm)
- Duplex LC connector
- Operating case temperature: 0°C to 75°C
- Single 3.3 V power supply
- Typical power consumption 22W(400GbE), maximum power consumption 22.5W(400GbE)
- RoHS 2 compliant

Application area

- Edge DCI with extended Reach or with OLP protection
- IP Over Metro or Long Haul DWDM
- Up to 80Km ~ 120km at 400G Gray Light mode unamplified 400G P2P link

Technical specification

Parameter	OIF 400ZR	Metro	Regional	Long-haul	ULH
MSA compliance	OIF 400ZR Implementation Agreement (IA)	OpenZR+ MSA			
Speed	1x400GbE 4x100GbE	1x400GbE 4x100GbE	3x100GbE	2x100GbE	1x100GbE
Modulation format	DP-16QAM	DP-16QAM	DP-8QAM	DP-QPSK	DP-QPSK
FEC types	Concatenated FEC (CFEC)	OFEC			
Max Pre-FEC BER	1.7E-2	2.0E-2			
Channel plan wavelength range	1567.13 ~ 1528.77 nm				
Channel plan frequency range	191.3 ~ 196.1 THz				
Channel spacing	75GHz or greater				50GHz or greater
Channel tunability	3.125GHz grid tuning				
Optical transmitter output power (on)	-10 ~ +1dBm Adjustable				
	Tx output power accuracy: +/-1dB				
Optical transmitter output power (off)	Max. -20dBm				
Optical transmitter wavelength accuracy	+/-1.8GHz				
Optical transmitter channel tuning time	60s				
Optical Transmitter OSNR (in-band)	38dB				
Optical receiver input power range (DWDM Amplified)	-12 ~ +0dBm	-12 ~ +0dBm	-15 ~ +0dBm	-18 ~ +0dBm	-20 ~ +0dBm
Optical receiver damage input power threshold	Max.+10dBm				
Optical receiver input sensitivity (ROSNR > 34dB)	-20dBm	-22dBm	-24dBm	-24dBm	-24dBm
Optical receiver minimum OSNR (back-to-back), worst-case, EOL	26dB	24dB	21dB	16dB	12.5dB
Optical receiver chromatic dispersion tolerance	2400ps/nm	20000ps/nm	40000ps/nm	50000ps/nm	100000ps/nm
Optical receiver polarization tracking	50krad/s				
Receiver PDL Tolerance	3.0dB(Tolerance to peak PDL with ≤ 1.3dB additional OSNR penalty when change in SOP is ≤1 rad/ms) 3.5dB(Tolerance to peak PDL with ≤ 1.8dB additional OSNR penalty when change in SOP is ≤1 rad/ms)				
Distance(single wavelength unamplified)	80km	90km	90km	110km	120km
Distance (DWDM Amplified)	120km	450km	600km	1000km	2000km
Power consumption (EOL)	22.5W				
Operating Case Temperature	0 ~ +75 °C				
Storage temperature	-40 ~ +85 °C				