400G QSFP-DD LR4 10km

400G Eth, QSFP-DD, PAM4, LR4, 10km, LC, 1311nm, SM

CDD-4E-LR-CDFT02

OVERVIEW

The CDD-4E-LR-CDFT02 is a QSFP-DD optical transceiver designed for 400 Gigabit Ethernet applications over single-mode fiber (SMF). It supports the 400GBASE-LR4 standard and enables high-speed optical communication up to 10km using four CWDM wavelengths with PAM4 modulation. The module complies with QSFP-DD MSA, 100G Lambda MSA, IEEE 802.3bs, and CMIS 5.0 specifications.

The module converts 8x 53.125Gb/s PAM4 electrical input lanes (400GAUI-8 interface) into 4 CWDM optical lanes operating at 1271nm, 1291nm, 1311nm, and 1331nm. On the receive side, the incoming optical signals are demultiplexed and converted back into eight electrical output lanes. The transmitter utilizes cooled EML lasers, while host-side FEC enables reliable transmission over distances up to 10km.

The transceiver operates from a single 3.3V power supply with a maximum power consumption of 12W and is housed in a QSFP-DD form factor with a duplex LC optical interface. Digital Diagnostic Monitoring (DDM) is supported through the CMIS management interface, providing real-time monitoring of module temperature, supply voltage, transmit bias current, transmit optical power, and receive optical power. The module supports a commercial operating temperature range of 0°C to +70°C and is ideal for data center interconnect and enterprise networking applications.

KEY SPECIFICATIONS

- 400G QSFP-DD optical transceiver with duplex LC connector
- Compliant with QSFP-DD MSA, IEEE 802.3bs, 100G Lambda MSA, and CMIS 5.0
- 8 × 53.125Gb/s PAM4 electrical interface (400GAUI-8) with 4-lane CWDM optical transmission
- Supports transmission up to 10km over single-mode fiber (SMF) using cooled EML lasers
- Maximum power consumption: 12W with a single 3.3V power supply
- Supports Digital Diagnostic Monitoring (DDM) and commercial operating temperature of 0°C to +70°C

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TECHNICAL DATA

Parameter	Value	Parameter	Value
Form Factor	QSFP-DD	**Transmitter Data:**	
Transmission Media	SM (2x LC)	Tx Power	-2.7 to +5.1dBm[3]
Typical Reach	10km	Tx Power, OMA	+0.3 to +4.4dBm
Nominal Wavelength	1271nm 1291nm 1311nm 1331nm	Tx Wavelength	1264.5 -1277.5nm 1284.5 - 1297.5nm 1304.5 - 1317.5nm 1324.5 - 1337.5nm
Data Rate Support	425Gbps[1] 53.125Gbd[2]	Extinction Ratio	≥ 3.5dB
Protocol Support	400GbE	**Receiver Data:**	
Power Consumption	<12W	Rx Power, min	-9dBm[3]
Operating Temperature	0°C to 70°C	Rx Sensitivity, OMA	-6.8dBm[4]
Storage Temperature	-40°C to 85°C	Rx Overload, max	+5.1dBm[3]
DDM	Yes	Rx Wavelength	1264.5 -1277.5nm 1284.5 - 1297.5nm 1304.5 - 1317.5nm 1324.5 - 1337.5nm
		LOS Assert	-20dBm
		LOS De-assert	-12.2dBm
		LOS Hysteresis	0.5dB

[1] Aggregated line rate 400GbE
[2] Line baud rate per 53.125GBd lane
[3] Average Power, per lane
[4] Per 53.125GBd lane.

Safety/Regulatory Compliance

- Class 1 laser safe
- RoHS Compliance

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ABSOLUTE MAX RATING

Exceeding these limits can cause permanent damage to the transceiver

Parameter	Value	Parameter	Value
Supply Voltage	0V - 4V	Relative Humidity	90%
Storage Temp	-40°C to 85°C	Max Rx Optical Power	+6.1dBm per lane

ORDERING INFORMATION

Ordering Code	Description
CDD-4E-LR-CDFT02	400G QSFP-DD, PAM4, LR4, 10km, LC, 1311nm, SM, 0 to 70C

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