

**AT A GLANCE**

E.C.I. NETWORKS’s QSFP-DD or QSFP56-DD transceiver module is designed for use in 200/400 Gigabit Ethernet links up 10km single mode fiber. QSFP-DD ports is mechanically and electrically compatible with QSFP28 and QSFP+. The module is hot pluggable when mated to a compliant 76-pin connector that delivers a supply voltage of 3.3 V.

EN-QDD-LR8 is a 400G Quad Small Form Factor Pluggable-double density (QSFP-DD) optical module designed for 10km km optical communication applications. The module contains 8-lane optical transmitter, 8-lane optical receiver and module management block including 2 wire serial interfaces and multiplexes them into a single channel for 400Gb/s optical transmission. Reversely, on the receiver side, the module optically de-multiplexes a 400Gb/s optical input into 8 channels of 50Gb/s (PAM4) electrical output data.

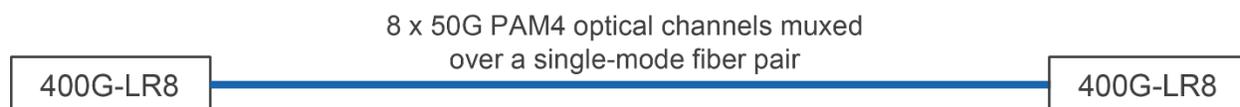
**PRODUCT FEATURES**

- ◆ QSFP-DD MSA compliant
- ◆ Supports 425Gb/s bit rate
- ◆ 8 LAN-WDM lanes MUX/DEMUX design
- ◆ Duplex LC connector
- ◆ Up to 10km transmission on single mode fiber (SMF)
- ◆ Compliant to IEEE 802.3bs 400GBASE-LR8
- ◆ 8x53.125Gb/s electrical interface (400GAUI-8)
- ◆ Hot pluggable 76 pin electrical interface
- ◆ Maximum power consumption 14.5W
- ◆ RoHS compliant
- ◆ I2C interface with integrated DDM
- ◆ Commercial operating temperature: 0 to +70 °C



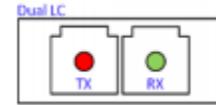
**APPLICATIONS EXAMPLES**

Usually used DCI within data centers, or across data centers for up to 10km use.



**EN-QDD-LR8 Direct Connectivity**

The 400G-FR4/LR4/LR8 modules use duplex LC fiber connectors – the same connectors that are used on existing 100G and 40G QSFPs that use duplex SMF (e.g. 100G-CWDM4, 40G-LR4 etc).



**Ordering Information**

Part Number	Description	Data Rate	Wavelength	Distance
EN-QDD-LR8-xx	400GBASE-LR8 transceiver, up to 10km over duplex SMF, LC Connector, 8 LAN-WDM Lanes	400G	1273.54 1277.89 1282.26 1286.66 1295.56 1300.05 1304.58 1309.14	10 KM

**Product Selection**

xx: Refers to vendor compatibility

I: I refers to Industrial Temperature where applicable

Per example:

EN-SFP10G-LR-EZ refers to Commercial Temperature, and compatible with Evertz, EN-SFP10GIDL-JREX refers to Industrial Temperature, and compatible with Juniper EX Series

\*\* Please note pricing is same for most of the NEMs including Cisco, Juniper, F5, Fortinet, except HP, Evertz. There is an additional charge

**Compatibility; Tested and Proven**

- ◆ Proven Compatibility and Interoperability with; TBD

**Compliance**

All our products come with Built-in digital diagnostic functions DDM Compliant with SFF-8472 Rev12 and Compliant with the MSA SFF SPECIFICATIONS.

**ABSOLUTE MAXIMUM RATING**

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	T <sub>s</sub>	-40	85	°C
Relative Humidity	RH	0	85	%
Supply Voltage	V <sub>cc</sub>	-0.5	3.6	V

**Recommended Operating Conditions**

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T <sub>c</sub>	0	25	70	°C
Supply Voltage	V <sub>cc</sub>	3.135	3.3	3.465	V
Power Dissipation	P <sub>d</sub>	-	13.4	14.5	W
Data Rate, each Lane			26.5625		GBd
Data Rate Accuracy		-100		100	ppm
Link Distance	D	0.5		10000 (LR8)	m

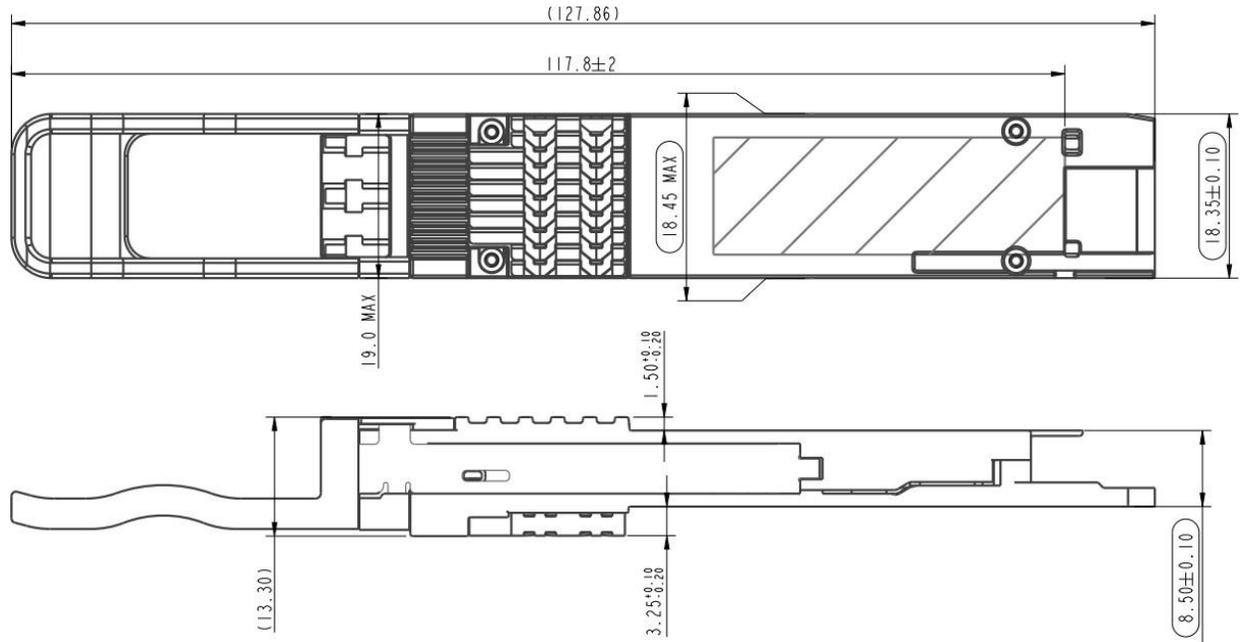
**Optical Characteristics**

**EN-QDD-LR8**

Parameter	Symbol	Min	Typical	Max	Units	Notes
Wavelength Assignment	L0	1272.55	1273.54	1274.54	nm	
	L1	1276.89	1277.89	1278.89	nm	
	L2	1281.25	1282.26	1283.27	nm	
	L3	1285.65	1286.66	1287.68	nm	
	L4	1294.53	1295.56	1296.59	nm	
	L5	1299.02	1300.05	1301.09	nm	
	L6	1303.54	1304.58	1305.63	nm	
	L7	1308.09	1309.14	1310.19	nm	
<b>Transmitter</b>						
Data Rate, each Lane		26.5625 ± 100 ppm			GBd	
Modulation Format		PAM4				
Side-mode Suppression Ratio	SMSR	30			dB	Modulated
Total Average Launch Power	PT			13.2	dBm	
Average Launch Power, each Lane	PAVG	-2.8		5.3	dBm	1
Outer Optical Modulation Amplitude (OMA <sub>outer</sub> ), each Lane	POMA	0.2		5.7	dBm	2
Launch Power in OMA <sub>outer</sub> minus TDECQ, each Lane		-1.2			dB	For ER ≥4.5 dB
Launch Power in OMA <sub>outer</sub> minus TDECQ, each Lane		-1.1			dB	For ER <4.5 dB
Transmitter and Dispersion Eye Clouser for PAM4, each Lane	TDECQ			3.1	dB	
Extinction Ratio	ER	3.5			dB	

RIN17.1OMA	RIN			-132	dB/H z	
Optical Return Loss Tolerance	TOL			15.6	dB	
Transmitter Reflectance	TR			-26	dB	
Average Launch Power of OFF Transmitter, each Lane	P <sub>off</sub>			-30	dBm	
<b>Receiver</b>						
Data Rate, each Lane		26.5625 ± 100 ppm			GBd	
Modulation Format		PAM4				
Damage Threshold, each Lane	TH <sub>d</sub>	6.3			dBm	
Average Receive Power, each Lane		-9.1		5.3	dBm	
Receive Power (OMA <sub>outer</sub> ), each Lane				5.7	dBm	
Difference in Receiver Power between any Two Lanes (OMA <sub>outer</sub> )				4.5	dB	
Receiver Sensitivity (OMA <sub>outer</sub> ), each Lane	SEN			-6.6	dBm	
Receiver Reflectance	R			-26	dB	
LOS Assert	LOSA	-25.1			dBm	
LOS De-assert	LOSD			-11.1	dBm	
LOS Hysteresis	LOSH	0.5			dB	

Mechanical specifications



Regulatory Compliance

Feature	Reference	Performance
Electrostatic discharge (ESD)	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10, 1040.11 IEC/EN 60825-1, 2	Class 1 laser product
Component Recognition	IEC/EN 60950, UL	Compatible with standards
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards

**Notice:**

ECI Networks reserves the right to make changes to or discontinue any optical link product or service identified in this publication, without notice, in order to improve design and/or performance. Applications that are described herein for any of the optical link products are for illustrative purposes only.

For further information



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