

QDD-800G-2LR4

QSFP-DD 800G 2xLR4 2x400Gbps PAM4, 1310nm 6dB 10km Dual LC SM

1. Product overview

800G QSFP-DD optical transceiver for single-mode fiber, with dual duplex LC/UPC connectivity and a reach of 10 km. Two duplex LC connectors provide two physically distinct 400G LR4 links without optical breakout cables. An integrated Broadcom 7 nm DSP supports the electrical-to-optical conversion.

2. Key features

Hot-pluggable QSFP-DD; 8 electrical lanes; 18 W maximum; CMIS 5.0; two-wire serial interface with digital diagnostic monitoring; 0 to 70°C case temperature. Dual-interface design supports flexible breakout networking.

3. Applications

800G Ethernet; data centers; 2x400G LR4 breakout.

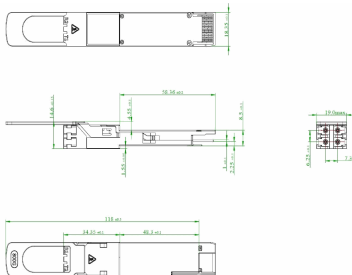
4. Technical data

Absolute maximum ratings	Value	Absolute maximum ratings	Value
Storage temperature	-40 to +85°C	Supply voltage	-0.5 to 3.6 V
Relative humidity	5-95%, non-condensing	Differential data input	1 V max
Control input voltage	-0.3 to Vcc+0.5 V	Control output current	-20 to +20 mA

High-speed electrical characteristics - IEEE 802.3ck C2M; TP1/TP1a module input, TP4 module output.

Module input	Specification	Module output	Specification
Differential input tolerance	750 mV p-p min	Differential output, p-p	600 / 845 mV max (short / long); disabled 35 mV max
AC common-mode tolerance	32 / 80 mV p-p min (low / full band)	AC common-mode output	32 / 80 mV p-p max (low / full band)
Differential-to-common return loss	802.3ck 120G-2 (dB)	Common-to-differential return loss	802.3ck 120G-1 (dB)
Effective return loss	8.5 dB min	Effective return loss	8.5 dB min
Termination mismatch	10% max	Termination mismatch	10% max
Single-ended tolerance	-0.4 to 3.3 V	Eye height / vertical eye closure	15 mV min / 12 dB max
DC common-mode tolerance	-0.35 to 2.85 V	DC common-mode / transition	-0.35 to 2.85 V / 8.5 ps min

Mechanical drawing - source dimensions in mm.



Simplified functional illustration



Module pin mapping and low-speed electrical limits are listed on page 2.

5. Recommended operating conditions

Parameter	Specification	Parameter	Specification
Case temperature / supply	0-70°C / 3.135 / 3.3 / 3.465 V (min/typ/max)	Lane speed / TWI clock	53.125 GBd typ / 400 kHz max
Peak hot-plug current	7200 mA max	Sustained hot-plug current	5941 mA max
Power / low-power max	18 W / 2 W	Supply noise, 1 kHz-1 MHz	66 mV p-p max
Control high / low	0.7Vcc to Vcc+0.3 V / -0.3 to 0.3Vcc V	Operating distance	2-10000 m MSA; 2-6000 m IEEE

QDD-2LR4-800G

6. Optical characteristics

TX and RX lane wavelengths		Min / typical / max (nm)	
L0, L4 / L1, L5		1264.5 / 1271 / 1277.5 1284.5 / 1291 / 1297.5	
L2, L6 / L3, L7		1304.5 / 1311 / 1317.5 1324.5 / 1331 / 1337.5	

Transmitter	Specification	Receiver / stress conditions	Specification
SMSR	30 dB min	Damage threshold / lane	6.1 dBm min
Total average launch power	11.1 dBm max	Average receive power / lane	-9 to +5.1 dBm
Average launch power / lane	-2.7 to +5.1 dBm	Receive OMAouter / lane	4.4 dBm max
OMAouter / lane, minimum	-0.3 dBm if TDECQ <1.4 dB; -1.1 + TDECQ dBm if 1.4 ≤ TDECQ ≤3.4 dB	Lane-to-lane receive OMA difference	4.3 dB max
OMAouter / lane, maximum	4.4 dBm	Receiver reflectance	-26 dB max
Lane-to-lane launch OMA difference	4 dB max	Receiver sensitivity OMAouter, max	-6.8 dBm for TECQ <1.4 dB; -8.2 + TECQ dBm for 1.4 ≤ TECQ ≤ TECQ(max)
TDECQ / TECQ, each lane	3.9 / 3.9 dB max (10 km); 3.4 / 3.4 dB max (6 km)	Stressed RX sensitivity / lane	-4.3 dBm max (10 km); -4.8 dBm max (6 km)
TDECQ - TECQ	2.5 dB max	SECQ, lane under test	3.9 dB typ (10 km); 3.4 dB typ (6 km)
Over/under-shoot	25% max (10 km); 22% max (6 km)	OMAouter, each aggressor lane	-0.4 dBm typ
Power excursion / peak-to-peak	5.2 dBm max p-p (10 km); 2.5 dBm max excursion (6 km)		
TX-off average power / lane	-16 dBm max		
Extinction ratio / transition	3.5 dB min / 17 ps max		
RIN15.6OMA	-136 dB/Hz max		
Optical return loss tolerance	15.6 dB max		
Transmitter reflectance	-26 dB max		

Minimum average TX launch power is informative, not the principal signal-strength indicator. TX reflectance is defined looking into the transmitter. Stressed sensitivity: conformance signal at TP3, BER 2.4x10⁻⁴. Stress-test values describe the test signal, not receiver operating limits.

7. Digital diagnostics and management

Temperature 0-70°C, ±3°C; voltage 3.135-3.465 V, ±3%; per-lane bias 0-100 mA, 10%; TX power -2.7 to +5.1, ±3; RX power -9 to +5.1, ±3 (source optical-monitor unit: dB).

Low-speed electrical signals	Limits (min to max)
SCL/SDA output / input	VOL 0-0.4 V; input VIL -0.3 to 0.3Vcc V; VIH 0.7Vcc to Vcc+0.5 V
LPMode/TxDis, ResetL, ModSell	VIL -0.3 to 0.8 V; VIH 2 to Vcc+0.3 V
IntL/RxLOS	VOL 0-0.4 V; VOH Vcc-0.5 to Vcc+0.3 V

76-pin map (p/n pairs, lanes 1-8): TX CML-I: 36/37, 3/2, 33/34, 6/5, 74/75, 41/40, 71/72, 44/43. RX CML-O: 17/18, 22/21, 14/15, 25/24, 55/56, 60/59, 52/53, 63/62. 3.3 V supplies: RX 10/48; TX 29/67; Vcc1/2 30/68. LVTTTL inputs: select 8, reset 9, low-power/optional TX-disable 31; outputs: presence 27, interrupt/optional RX-LOS 28. SCL/SDA 11/12: LVCMOS-I/O. Vendor-specific P/V54/1 inputs 46/47 and P/V52/3 outputs 49/50: LVCMOS/CML. ePPS/Clock 69: LVCMOS-I, 1PPS PTP/reference clock. 65 NC; 66 reserved. All other pins GND.

8. Safety and regulatory

IEEE 802.3cu-2022: 2x400G-LR4-10 and 2x400GBASE-LR4-6 optical; IEEE 802.3df-2024: 2x400GAUI-4 C2M; QSFP-DD800 MSA HW 6.01, dual LC; CMIS 5.0; EU 2011/65/EU (RoHS); Class 1 laser.

9. Ordering information

Original part number	Description
QDD-800G-2LR4	800GBASE-2LR4 QSFP-DD PAM4, 1310 nm, 10 km, DOM, dual duplex LC/UPC, SMF