

40G QSFP+ Active Optical Cables

Leader Optec’s 40G QSFP+ Active Optical Cables (AOC) are high-performance, cost-effective interconnect solution which supports high-performance computing clusters as well as other optical links. The cables are designed with form factor, and optical/electrical connection according to the QSFP Multi-Source Agreements (MSA). 40G AOC cables with QSFP+ transceivers have a wide range of applications in Data Centres, Rack-to-rack optical links, and 40G Ethernet.



Features & Benefits

- Hot-pluggable electrical interface
- Operating case temperature: 0 to 70°C
- RoHS compliant
- Electrical interface compliant to QSFP+ connector
- Transmission data rate up to 10.3125Gbit/s
- Low power consumption <1.5W
- Power supply voltage 3.3V

Application

- Data centres
- 40GBASE-SR4 40G Ethernet
- High-performance computing clusters
- Fibre channel applications

Product Specifications

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Storage temperature	Ts	-40	-	85	°C
Relative humidity	RH	0	-	85	%
Case operating temperature	TOP	0	-	70	°C
Supply voltage	VCC	-0.3	-	3.6	V
Input voltage	Vin	-0.3	-	Vcc+0.3	V

Product Specifications

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating case temperature range	Top	0	-	70	°C
Power supply voltage	Vcc	3.135	3.3	3.465	V
Signaling rate, each channel	Dr	-	10.3125	-	Gb/s
Data rate accuracy	-	-100	-	100	Ppm
Bit error ratio	-	-	-	1e-12	-
Fibre bend radius	Rb	3	-	-	cm

Electrical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply current, each terminal	Icc	-	-	750	mA
Power consumption	Pc	-	-	2.5	W
Transceiver power-on initialize time	-	-	-	2000	ms
Transmitter					
Differential input voltage swing	Vin,pp	180	-	1000	mVpp
AC common mode input voltage tolerance	-	15	-	-	mV
Input differential impedance	Zin	90	100	110	Ohm
Single-ended input voltage tolerance	-	-0.3	-	3.6	V
Receiver					
Single-ended output voltage tolerance	-	0.3	-	4	V
AC common mode voltage	Vcm	-	-	7.5	mV
Differential output voltage swing	Vout,pp	300	-	1000	mVpp
Output differential impedance	Zout	90	100	110	Ohm

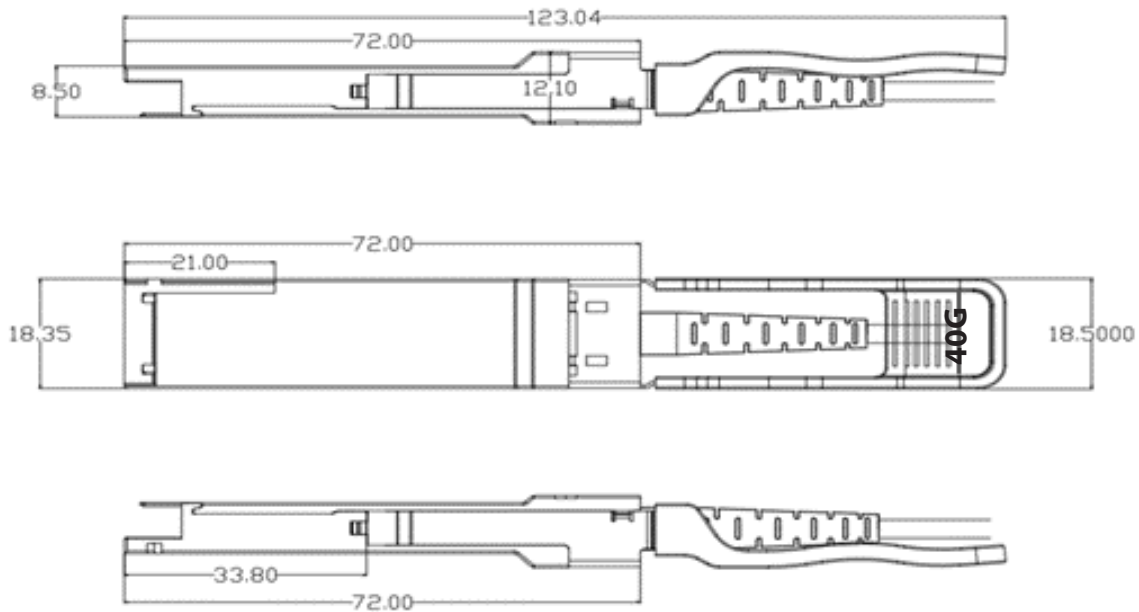
Note: FEC provided by host systems

Optical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Transmitter					
Centre wavelength	λ_c	840	850	860	nm
Average launch power, each channel	Pout	-8.4	-	2.4	dBm
Extinction ratio	ER	3	-	-	dB
Transmitter and dispersion eye closure	TDEC	-	0.53	-	dB
Receiver					
Centre wavelength	λ_c	840	850	860	nm
Peak power at receiver, each lane	-	-	-	4	dBm
Average power at receiver, each lane	-	-	-	2.3	dB
Receiver reflectance	-	-	-	-12	dB
Stressed receiver sensitivity (OMA), each lane	-	-	-	-5.4	dBm

Mechanical Drawing

Fig 1: Package Outline



Note: Unit - mm

Pin Assignment

Fig 2: Electrical Pin-Out Details

Top Side - Viewed from top

38	GND	█
37	TX1n	█
36	TX1p	█
35	GND	█
34	TX3n	█
33	TX3p	█
32	GND	█
31	LPMode	█
30	Vcc1	█
29	VccTx	█
28	IntL	█
27	ModPrsL	█
26	GND	█
25	RX4p	█
24	Rx4n	█
23	GND	█
22	RX2p	█
21	RX2n	█
20	GND	█

Bottom Side - Viewed from bottom

█	GND	1
█	TX2n	2
█	TX2p	3
█	GND	4
█	TX4n	5
█	TX4p	6
█	GND	7
█	ModselL	8
█	ResetL	9
█	VccRx	10
█	SCL	11
█	SDA	12
█	GND	13
█	RX3p	14
█	Rx3n	15
█	GND	16
█	RX1p	17
█	RX1n	18
█	GND	19

Module Card Edge

Pin Definition Receiver Specifications

Pin	Logic	Symbol	Name/Description
1	-	GND	Ground
2	CML-I	Tx2n	Transmitter Inverted Data Input
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input
4	-	GND	Ground
5	CML-I	Tx4n	Transmitter Inverted Data Input
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input
7	-	GND	Ground
8	LVTTL-I	ModSelL	Module Select
9	LVTTL-I	ResetL	Module Reset
10	-	Vcc Rx	3.3 V Power supply receiver
11	LVCOMS-I/O	SCL	2-wire serial interface clock
12	VCOMS-I/O	SDA	2-wire serial interface data
13	-	GND	Ground
14	CML-O	Rx1p	Receiver Non-Inverted Data Output
15	CML-O	Rx1n	Receiver Inverted Data Output
16	-	GND	Ground
17	CML-O	GND	Receiver Non-Inverted Data Output
18	CML-O	Rx2n	Receiver Inverted Data Output
19	-	Rx2p	Ground
20	-	GND	Ground
21	CML-O	Rx2n	Receiver Inverted Data Output
22	CML-O	Rx2p	Receiver Non-Inverted Data Output
23	-	-	Ground
24	CML-O	Rx4n	Receiver Inverted Data Output
25	CML-O	Rx4p	Receiver Non-Inverted Data Output
26	-	GND	Ground
27	LVTTL-O	ModPrsL	Module Present
28	LVTTL-O	IntL	Interrupt
29	-	Vcc Tx	+3.3 V Power supply transmitter
30	-	Vcc1	+3.3 V Power Supply
31	LVTTL-I	LPMODE	Low Power Mode
32	-	GND	Ground
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input
34	CML-I	Tx3n	Transmitter Inverted Data Input
35	-	GND	Ground
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input
38	-	GND	Ground