

40G QSFP+ to 4x10G SFP+ Active Optical Cables

The Four-Channel, Pluggable, Parallel, Fibre-Optic QSFP+ Active Optical Cable (AOC) to 4x SFP+ Active Optical Cable break-out solution is intended for 40G to 4x10G applications. This AOC is a high-performance cable for short-range multi-lane data communication and interconnect applications. It integrates four data lanes in each direction with 40 Gbps aggregate bandwidth. Each lane can operate at 10.3125 Gbps. These cables also support 4 x 10G InfiniBand QDR applications. Datatronix QSFP+ to 4x 10G SFP+ AOC cable is a 40GBase QSFP+ hybrid optical cable. A side is a QSFP+ optical connector, B side is 4 SFP+ optical connectors. It's an application for link with QSFP+ port on 40Gb/s rate switch or host and feed up to 4 upstream 10Gb/s switch or host.

Applications

- 40GbE and 10GbE break-out applications for Datacom switch and router connections
- 40G to 4x10G density applications for Datacom and Proprietary protocol applications
- Data centres

Features

- Electrical interface compliant to SFF-8436 and SFF-8431
- 850nm VCSEL laser and PIN photo-detector
- Built-in digital diagnostic functions
- Operating case temperature 0°C to 70°C
- Hot Pluggable
- RoHS compliant

Specifications

Absolute Maximum Ratings

ELEMENT	VALUE	SYMBOL	MIN	MAX
Storage Temperature	°C	T _S	-20	85
Relative Humidity	%	R _H	0	85
Case Operating Temperature	°C	T _{Case}	0	70
Supply Voltage	V	V _{CC}	-0.5	3.6

Recommended Operating Conditions

ELEMENT	VALUE	SYMBOL	MIN	TYPICAL	MAX
Case Operating Temperature	°C	T _{Case}	0		70
Supply Voltage	V	V _{CC}	3.13	3.3	3.47
Supply Current (QSFP+)	mA	I _{CC}			300
Supply Current (SFP+)	mA	I _{CC}			100
Data Rate Per Lane	Gbit/s	DR		10.3125	

Transmitter Specifications

Measurement condition: Channel data rate 10.3125Gbps, VCC=3.3V, PRBS31 pattern, Case operating temperature 0-70°C

ELEMENT	VALUE	SYMBOL	MIN	TYPICAL	MAX
QSFP+					
Center wavelength	nm	λ _c	840	850	860
Differential Input Impedance	Ohm	Z _{in}	80	100	120
Differential Input Voltage	mVp-p	V _{in}	120		1600
Average Launch Power per Lane	dBm	P _{AVG}	-5	-1	+1
Extinct Ratio	dB	ER	3.0		
SFP+					
Center wavelength	nm	λ _c	840	850	860
Differential Input Impedance	Ohm	Z _{in}	90	100	110

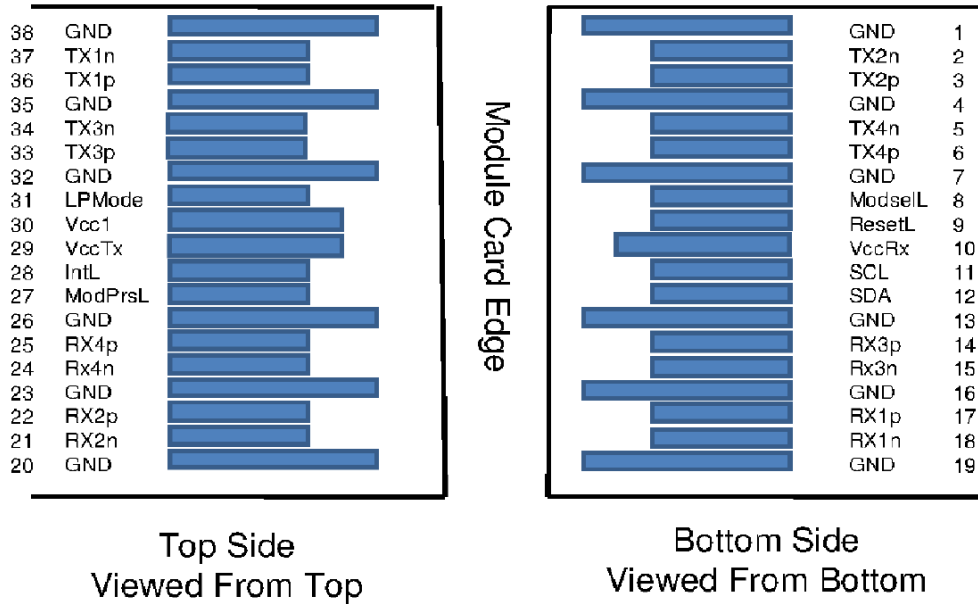
Differential Input Voltage	mVp-p	V_{in}	200		1600
Average Launch Power per Lane	dBm	P_{AVG}	-6.5	0	
Extinct Ratio	dB	ER	3.0		

Receiver Specifications

Measurement condition: Channel data rate 10.3125Gbps, $V_{CC}=3.3V$, PRBS31 pattern, Case operating temperature 0-70°C

ELEMENT	VALUE	SYMBOL	MIN	TYPICAL	MAX
QSFP+					
Center wavelength	nm	λ_c	840	850	860
Differential Output Impedance	Ohm	Z_{out}	80	100	120
Differential Output Voltage	mVp-p	V_{out}	320	450	
Receiver Sensitivity	dBm	S_{EN}		-12	-10
Bit Error Rate		BER			10^{-12}
SFP+					
Center wavelength	nm	λ_c	840	850	860
Differential Output Impedance	Ohm	Z_{out}	90	100	110
Differential Output Voltage	mVp-p	V_{out}	370		1600
Receiver Sensitivity	dBm	S_{EN}			-10
Bit Error Rate		BER			10^{-12}

QSFP+ Pin Descriptions

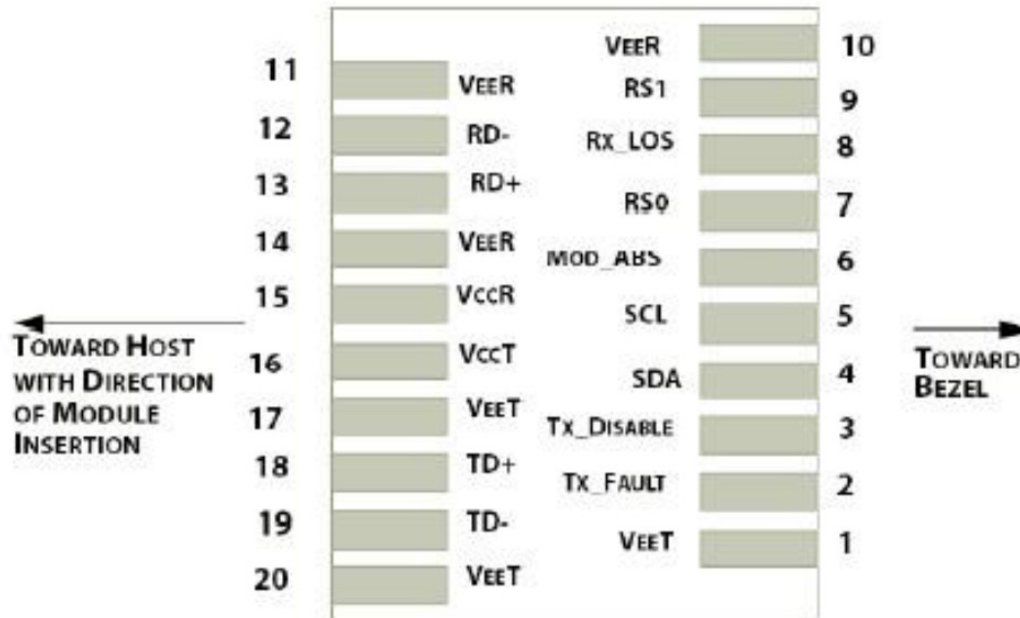


Pin Definitions

PIN	SYMBOL	NAME/DESCRIPTION
1	GND	Ground
2	Tx2n	Transmitter Inverted Data Input
3	Tx2p	Transmitter Non-Inverted Data Input
4	GND	Ground
5	Tx4n	Transmitter Inverted Data Input
6	Tx4p	Transmitter Non-Inverted Data Input
7	GND	Ground
8	ModSelL	Module Select
9	ResetL	Module Reset
10	Vcc Rx	+3.3 V Power supply receiver
11	SCL	2-wire serial interface clock
12	SDA	2-wire serial interface data
13	GND	Ground
14	Rx3p	Receiver Non-Inverted Data Output
15	Rx3n	Receiver Inverted Data Output
16	GND	Ground

17	Rx1p	Receiver Non-Inverted Data Output
18	Rx1n	Receiver Inverted Data Output
19	GND	Ground
20	GND	Ground
21	Rx2n	Receiver Inverted Data Output
22	Rx2p	Receiver Non-Inverted Data Output
23	GND	Ground
24	Rx4n	Receiver Inverted Data Output
25	Rx4p	Receiver Non-Inverted Data Output
26	GND	Ground
27	ModPrsL	Module Present
28	IntL	Interrupt
29	Vcc Tx	+3.3 V Power supply transmitter
30	Vcc1	+3.3 V Power Supply
31	LPMode	Low Power Mode
32	GND	Ground
33	Tx3p	Transmitter Non-Inverted Data Input
34	Tx3n	Transmitter Inverted Data Input
35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input
38	GND	Ground

SFP+ Pin Descriptions

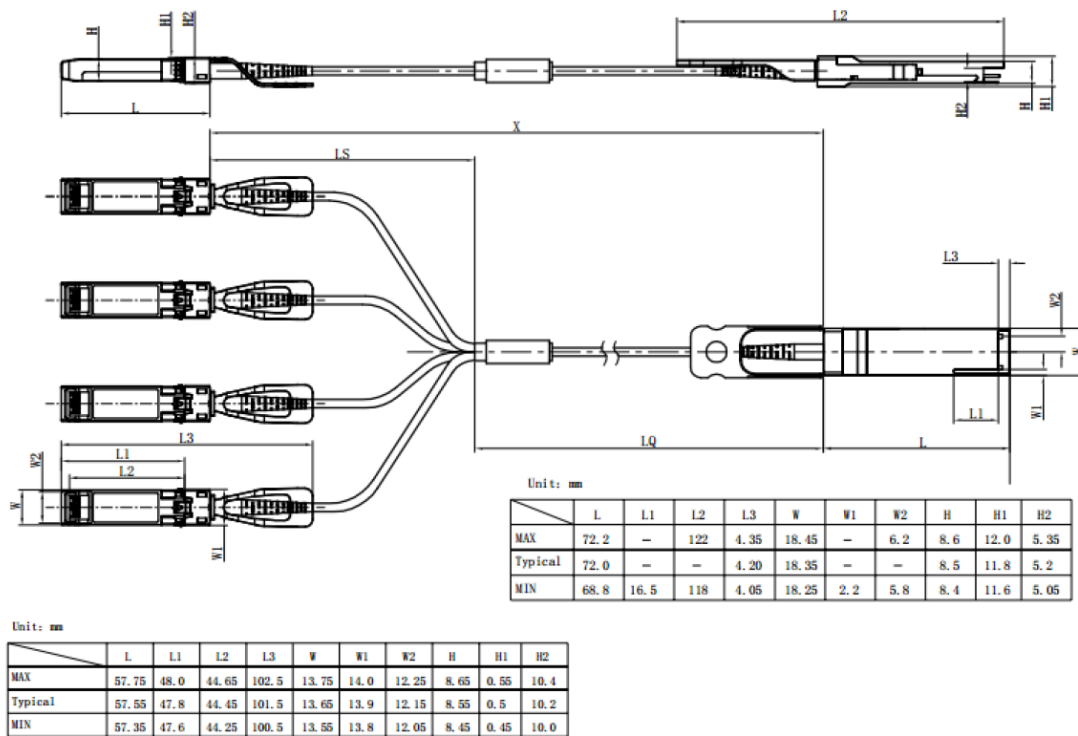


Pin Definitions

PIN	SYMBOL	NAME/DESCRIPTION
1	VeeT	Transmitter Signal Ground
2	TX_FAULT	Transmitter Fault (LVTTTL-O) – Not used. Grounded inside the module
3	TX_DISABLE	Transmitter Disable (LVTTTL-I) – High or open disables the transmitter
4	SDA	Two Wire Serial Interface Data Line (LVCMOS – I/O) (same as MOD-DEF2 in INF-8074)
5	SCL	Two Wire Serial Interface Clock Line (LVCMOS – I/O) (same as MOD-DEF1 in INF-8074)
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module
7	RS0	Rate Select 0 - Not used, Presents high input impedance.
8	RX_LOS	Receiver Loss of Signal (LVTTTL-O)
9	RS1	Rate Select 1 - Not used, Presents high input impedance.
10	VeeR	Receiver Signal Ground
11	VeeR	Receiver Signal Ground
12	RD-	Receiver Data Out Inverted (CML-O)
13	RD+	Receiver Data Out (CML-O)
14	VeeR	Receiver Signal Ground
15	VccR	Receiver Power + 3.3 V

16	VccT	Transmitter Power + 3.3 V
17	VeeT	Transmitter Signal Ground
18	TD+	Transmitter Data In (CML-I)
19	TD-	Transmitter Data In Inverted (CML-I)
20	VeeT	Transmitter Signal Ground

Mechanical Specifications



Ordering Information

DESCRIPTION

PART NUMBER

Datatronix 40G QSFP+ to 4x10G SFP+ Active Optical Cable

QSFP-SFP-AOC-40410-XXX-YYY

*where XXX is trunk cable length in metres & YYY is branch cable length in metres
Total cable length = Trunk length + Branch length