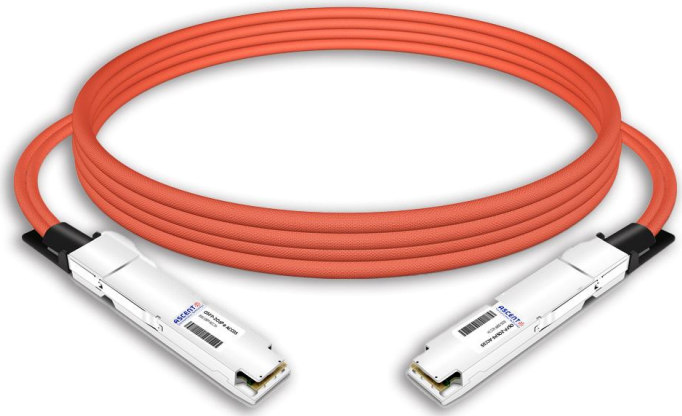
800G Twin-port 2x400G OSFP Active Copper Cable

800G OSFP Cable Series



- Compliant to OSFP MSA
- InfiniBand NDR compatible
- Low power consumption
- Supports device programming by MCU with I2C
- Power supply 3.3V
- Operating case temperature 0°C to +70°C
- RoHS2.0 compliant

Ascent OSFP-800G-ACC is a 800Gb/s twin-port OSFP (Octal Small Formfactor Pluggable)-to-2x400Gb/s twin-port OSFP Active Copper Cable (ACC) for InfiniBand NDR networking. ACC cables are the low-cost, low-latency, low-power consuming, high-speed links available due to their simplicity of design and minimal components.

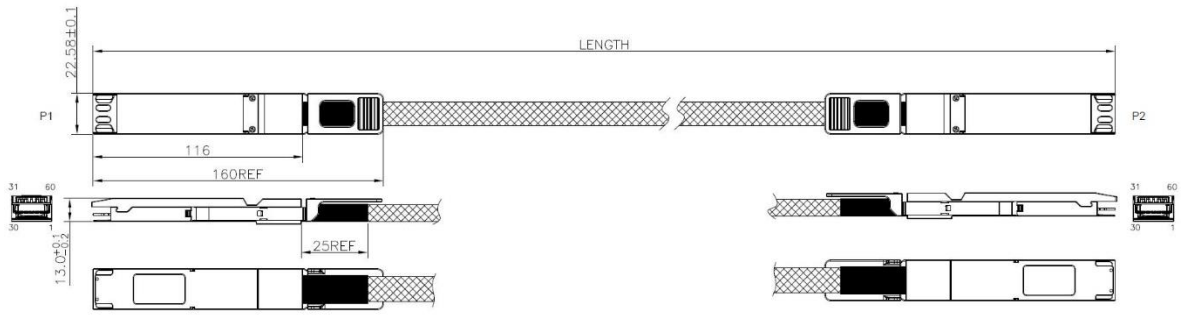
The “active” reference term in this cable refers to the passive copper cable with an equalizer integrated circuit to extend the length to 3, 4, and 5 meters while maintaining low-latency and low-power at 1.5 Watts per end. Thin 30AWG is used for 4m lengths and thicker 25AWG for 5m. Each end includes an EEPROM which provides product identification and characteristics to the host system.

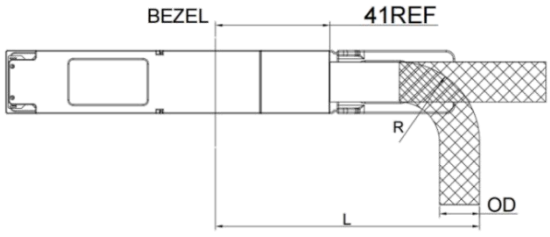
Every cable length is tuned to reduce signal noise and back reflections. The ACC firmware supports both InfiniBand and Ethernet and is automatically enabled depending on the protocol of the switch attached to. Ascent’s cable solutions provide power-efficient connectivity enabling higher port bandwidth, density and configurability at a low cost and reduced power requirement in the data centers. Rigorous cable production testing ensures best out-of-the-box installation experience, performance, and durability.

Key Features

- Module compliant to OSFP MSA
- InfiniBand NDR compatible
- Transmission data rate up to PAM4 106.25Gbps per channel
- Low power consumption
- Linear PAM4 programmable equalizer optimized for 56GBaud copper link up to max length 5M on 25AWG
- Enable Auto-Negotiation and Link Training
- Low latency<10ps
- Supports device programming by MCU with I2C
- Power supply 3.3V
- Operating case temperature 0°C to +70°C
- RoHS2.0 compliant

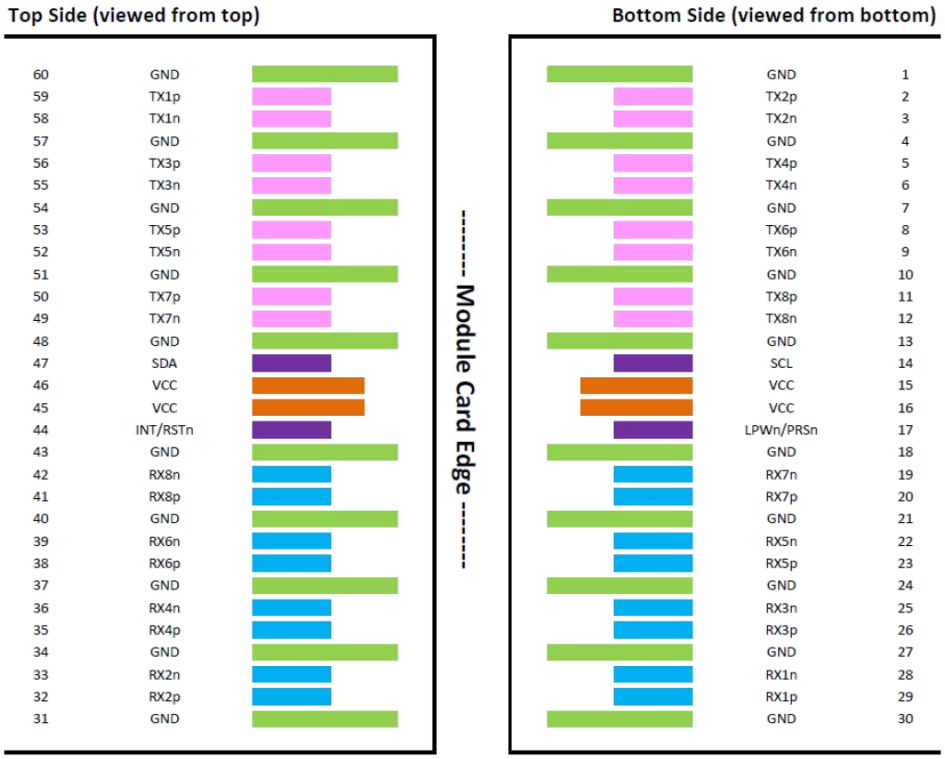
Mechanical Dimensions





OSFP TYPE2			
GAUGE	OD	BEND RADIUS "R"	MIN. BEND RADIUS "L"
32AWG	7.0MM	15MM	75MM
28AWG	10.2MM	21MM	81MM
26/25AWG	12.1MM	25MM	86MM

Pin Description



Pin	Symbol	Description	Logic	Direction	Plug Sequence	Notes
1	GND	Ground			1	
2	TX2p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
3	TX2n	Transmitter Data Inverted	CML-I	Input from Host	3	
4	GND	Ground			1	
5	TX4p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
6	TX4n	Transmitter Data Inverted	CML-I	Input from Host	3	
7	GND	Ground			1	
8	TX6p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
9	TX6n	Transmitter Data Inverted	CML-I	Input from Host	3	
10	GND	Ground			1	
11	TX8p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
12	TX8n	Transmitter Data Inverted	CML-I	Input from Host	3	
13	GND	Ground			1	
14	SCL	2-wire Serial interface clock	LVCMOS-I/O	Bi-directional	3	Open-Drain With pull-up resistor on Host
15	VCC	+3.3V Power		Power from Host	2	
16	VCC	+3.3V Power		Power from Host	2	

Pin	Symbol	Description	Logic	Direction	Plug Sequence	Notes
17	LPWn/PRSn	Low-Power Mode/ Module Present	Multi-Level	Bi-directional	3	See pin description for required circuit
18	GND	Ground			1	
19	RX7n	Receiver Data Inverted	CML-O	Output to Host	3	
20	RX7p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
21	GND	Ground			1	
22	RX5n	Receiver Data Inverted	CML-O	Output to Host	3	
23	RX5p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
24	GND	Ground			1	
25	RX3n	Receiver Data Inverted	CML-O	Output to Host	3	
26	RX3p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
27	GND	Ground			1	
28	RX1n	Receiver Data Inverted	CML-O	Output to Host	3	
29	RX1p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
30	GND	Ground			1	
31	GND	Ground			1	
32	RX2p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
33	RX2n	Receiver Data Inverted	CML-O	Output to Host	3	
34	GND	Ground			1	
35	RX4p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
36	RX4n	Receiver Data Inverted	CML-O	Output to Host	3	
37	GND	Ground			1	
38	RX6p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
39	RX6n	Receiver Data Inverted	CML-O	Output to Host	3	
40	GND	Ground			1	
41	RX8p	Receiver Data Non-Inverted	CML-O	Output to Host	3	
42	RX8n	Receiver Data Inverted	CML-O	Output to Host	3	
43	GND	Ground			1	
44	INT/RSTn	Module Interrupt / Module Reset	Multi-Level	Bi-directional	3	See pin description for required circuit
45	VCC	+3.3V Power		Power from Host	2	
46	VCC	+3.3V Power		Power from Host	2	

Pin	Symbol	Description	Logic	Direction	Plug Sequence	Notes
47	SDA	2-wire Serial interface data	LVCMOS-I/O	Bi-directional	3	Open-Drain With pull-up resistor on Host
48	GND	Ground			1	
49	TX7n	Transmitter Data Inverted	CML-I	Input from Host	3	
50	TX7p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
51	GND	Ground			1	
52	TX5n	Transmitter Data Inverted	CML-I	Input from Host	3	
53	TX5p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
54	GND	Ground			1	
55	TX3n	Transmitter Data Inverted	CML-I	Input from Host	3	
56	TX3p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
57	GND	Ground			1	
58	TX1n	Transmitter Data Inverted	CML-I	Input from Host	3	
59	TX1p	Transmitter Data Non-Inverted	CML-I	Input from Host	3	
60	GND	Ground			1	

Module Memory Map

Compatible with CMIS rev 5.0 or further CMIS revisions and customer spec

Specifications

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max	Unit
Supply Voltage	V_{cc}	-0.3	3.3	3.6	V
Storage Temperature	T_s	-40		85	°C
Operating Case Temperature	T_c	0		70	°C
Humidity	Rh	5		85	%
Data Rate			800		Gbps

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Length	L	0.5		5	M
AWG		32		25	AWG
Jacket Material		HAIRTAIL+ Technology Net, Red			

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V_{CC}	3.1	3.3	3.5	V
Input Amplitude		800		1200	mVpp
Input LOW Voltage	V_{IL}	-0.3		0.35*V_{CC}	V
Input HIGH Voltage	V_{IH}	0.65* V_{CC}		V_{CC} +0.3	V
Output Logic LOW	V_{OL}			0.25*V_{CC}	V
I2C Master Mode Output Frequency			400		kHz
800G end Power Consumption			1.2	1.5	W

High-Speed Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Raw Cable Impedance	Zca	90	100	110	ohm
Mated Connector Impedance	Zmated	85		115	ohm
Maximum Insertion Loss at 26.56 GHz	SDD21	11		19.75	dB
Differential to Common-Mode Return Loss	SCD11/22	$RLcd(f) \geq \begin{cases} 22-10(f/26.56) & 0.05 \leq f < 26.56 \\ 15-3(f/26.56) & 26.56 \leq f \leq 40 \end{cases}$ For 0.05 =f =40 GHz, Where f is the frequency in GHz			dB
Differential to Common-Mode Conversion Loss	SCD21-SDD21	$Conversion\_loss(f) - IL(f) \geq \begin{cases} 10 & 0.05 \leq f < 12.89 \\ 14-0.3108f & 12.89 \leq f \leq 40 \end{cases}$ For 0.05 =f =40 GHz, Where f is the frequency in GHz			dB
Common-mode to Common-Mode Return Loss	SCC11/22	RLCC)≥18 For 0.05 =f =40 GHz, Where f is the frequency in GH			kHz
Minimum COM	COM	3			dB
Minimum Cable Assembly ERL	ERL	8.25			dB
BER				$2.4x10^{-4}$	

Ordering Information

Product Name	Product Description
OSP8-800G-ACC01	800G Twin-port OSFP to 2x400G Twin-port OSFP IB NDR Active Copper Cable, 1m (3.2ft)
OSP8-800G-ACC02	800G Twin-port OSFP to 2x400G Twin-port OSFP IB NDR Active Copper Cable, 2m (6.4ft)
OSP8-800G-ACC03	800G Twin-port OSFP to 2x400G Twin-port OSFP IB NDR Active Copper Cable, 3m (9.6ft)
OSP8-800G-ACC04	800G Twin-port OSFP to 2x400G Twin-port OSFP IB NDR Active Copper Cable, 4m (12.8ft)
OSP8-800G-ACC05	800G Twin-port OSFP to 2x400G Twin-port OSFP IB NDR Active Copper Cable, 5m (16ft)

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Ver. ACT_OSFP-800G-ACC_Datasheet_V1b_Dec_2023