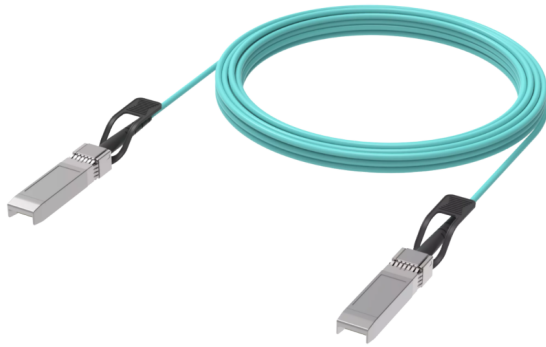




# NebulaConnect 10G SFP+ Active Optical Cable (AOC)



## Standards Compliance

- **SFP+ MSA** (Multi-Source Agreement)
- **SFF-8472** (Digital Diagnostic Monitoring Interface)

## Product Part Number

N951. NC10SFP-Ax

## Product Description

The **NebulaConnect 10G SFP+ Active Optical Cable (AOC)** is a high-performance, low-power interconnect solution designed for short-range data communication and interconnect applications. It supports **data rates up to 10.3125Gbps** and is available in a variety of standard lengths. Utilizing an integrated SFP+ form factor with embedded optical components, the AOC provides a cost-effective and easy-to-deploy alternative to discrete optical transceivers and fiber assemblies.

With an **operating case temperature range of 0°C to 70°C**, RoHS compliance, and compatibility with **SFP+ MSA and SFF-8472 standards**, NebulaConnect AOCs deliver high reliability and performance for today's data center and enterprise network environments

## Product Features

- Supports data rates up to 10.3125 Gb/s
- Operates from a single 3.3V power supply
- Low power consumption (typically <0.65W per end)
- Compact SFP+ Form Factor : Hot-pluggable for flexible deployment



## Applications

- Data Center & Enterprise Networking Equipment
- Servers and Storage Devices
- High-Performance Computing (HPC)
- Routers and Switches
- Telecom Central Offices (CO)
- Test and Measurement Equipment

## Material Specifications

Cable Jacket	LSZH (Low Smoke Zero Halogen)
Connector Housing	Zinc Alloy with Nickel Plating
Optical Fiber Type	OM3/OM4 Multimode Optical Fiber
Optical Wavelength	850nm
Optical Reach	1m to 100m
Data Rate	10.3125 Gbps
Connector Interface	Precision Molded Plastic/Metal Mix
Pull Tab	Polycarbonate (PC)
Strain Relief Boot	Thermoplastic Elastomer (TPE)
Labels	Polyester with Thermal Transfer Print

## Environmental Specifications

Operating Temperature Range (Case Temp (Tc))	0°C to 70°C
Storage Temperature Range	0°C to 70°C
Operating Relative Humidity (RH)	5% - 85% (No Condensation)
ESD Protection (Data Pins)	HBM Standard - 1,000V
ESD Protection (Other Pins)	HBM Standard - 2,000V



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## General Specifications (Ta = 0°C to 70°C for commercial-grade modules, unless otherwise noted)

Parameter	Minimum	Maximum	Typical
Operating Case Temperature (Tc)	0 °C	70 °C	
Power Supply Voltage (Vcc)	3.14 V	3.47 V	3.3 V
Supply Voltage Limitations (Vcc)	-0.5 V	3.6 V	
Power Consumption (per end)		0.65 W	
Lane Baud Rate			10.3125 Gbps
Bit Error Ratio (BER)		1E-12	
Data Speed Tolerance ( $\Delta$ DR)	-100 ppm	+100 ppm	

Exceeding the absolute maximum ratings may result in permanent damage to the device. These limits define stress conditions only, and functional operation is not guaranteed beyond the specified operating conditions. Prolonged exposure to absolute maximum ratings may lead to irreversible damage and reduced device reliability.

## PIN Definitions

PIN	Symbol	Name / Description
1	VeeT	Transmitter Ground
2	TX_Fault	Transmitter Fault Indicator
3	TX Disable	Transmitter Disable Control
4	SDA	2-Wire Serial Interface Data Line
5	SCL	2-Wire Serial Interface Clock
6	Mod_ABS	Module Absent
7	RS0	N/A
8	RX Los	Receiver Loss of Signal
9	RS1	N/A



10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Receiver Data Out (Inverted)
13	RD+	Receiver Data Out (Non-Inverted)
14	VeeR	Receiver Ground
15	VccR	Receiver Power Supply
16	VccT	Transmitter Power Supply
17	VeeT	Transmitter Ground
18	TD+	Transmitter Data In (Non-Inverted)
19	TD-	Transmitter Data In (Inverted)
20	VeeT	Transmitter Ground

Standard 20-pin SFP+ AOC Interface

## Digital Diagnostic Monitoring (DDM) Specifications

Parameter	Symbol	Accuracy	Notes
Transceiver Case Temperature	DMI_TEMP	±5 °C	Over full operating temperature
Supply voltage monitor absolute error	DMI_VCC	±3 %	Across full operating range
Channel Bias current monitor	DMI_IBIAS	±10 %	Per channel
Channel RX power monitor absolute error	DMI_RX	±3 dB	Per channel
Channel TX power monitor absolute error	DMI_TX	±3 dB	Per channel

## ESD Safety Precautions

This transceiver is specified for ESD protection at **1kV** for high-speed data pins and **2kV** for all other electrical input pins, based on the **Human Body Model (HBM)** per **MIL-STD-883, Method 3015.4 / JESD22-A114-A**. Despite this, standard ESD precautions should always be followed when handling the module. The product is shipped in **ESD-safe packaging** and should only be opened in an **ESD-protected environment**.



## NebulaConnect 10G SFP+ Active Optical Cable (AOC)

### Important Notice

The performance data, specifications, and illustrations provided in this datasheet are **typical values** and must be **formally confirmed in writing by Northern Link** before being considered applicable to any specific order or contract.

As part of Northern Link's commitment to **continuous improvement**, specifications are subject to change without prior notice. The publication of this information does not grant exemption from **patents or other protective rights** held by Northern Link or third parties.

For further details, please contact your **Northern Link sales representative**.

### Ordering Information

N951.NC10SFP-A5	NebulaConnect 10G SFP+ Active Optical Cable (AOC), 5m
N951.NC10SFP-A10	NebulaConnect 10G SFP+ Active Optical Cable (AOC), 10m
N951.NC10SFP-A20	NebulaConnect 10G SFP+ Active Optical Cable (AOC), 20m

