

Selection Guide for 800G High-Speed DAC Cables for Island Use



Overview

A Comprehensive Guide to 800G Ethernet DAC Cables This guide systematically analyzes the definition, direct connection and branching forms, application scen.

Key Takeaways

800G DAC cables are ideal for short-distance, high-speed interconnects within racks or between adjacent racks, offering low latency, low power consumption, and cost-effective deployment.

Overview of 800G DAC Cables

800G Ethernet DAC (Direct Attach Copper) cables are high-speed copper solutions designed for short-distance connections, transmitting signals directly through multi-channel electrical interfaces without optoelectronic conversion . They can be passive or active (Active DAC), with active designs incorporating minimal signal conditioning to improve signal integrity and extend reliable transmission distance . DACs typically come as fixed-length assemblies with pre-terminated pluggable interfaces, compatible with switches, servers, and storage arrays .

Key Selection Considerations

- Distance
- Passive DACs are effective for up to ~2 meters, making them suitable for in-rack connections .
- For slightly longer distances (2-5 meters), Active Electrical Cables (AEC) or Active DACs may be required to maintain signal integrity .

- Distances beyond 5 meters generally require Active Optical Cables (AOC) due to copper attenuation limits .
- Power and Latency
 - DACs consume minimal power and introduce very low latency, making them ideal for high-density GPU pods or AI clusters .
 - Active DACs or AECs add slight power overhead (~1-1.5W) but extend reach without significant latency impact .
- Connector and Form Factor
 - 800G DACs commonly use OSFP or OSFP-XD connectors, compatible with NVIDIA Spectrum switches and InfiniBand adapters .
 - QSFP-DD connectors are also supported in some 800G deployments, particularly for backward compatibility with 400G infrastructure .
- Deployment Scenarios
 - In-rack connections (5m): AOC is preferred due to immunity to EMI and reduced signal loss .
- Cost and Density
 - DACs are cost-effective and simple to deploy, with minimal thermal impact in dense racks .
 - AOCs offer slimmer profiles (3-4mm) for improved airflow and cable density but at higher cost and power consumption .

Practical Recommendations for Island Use

- For short, isolated deployments where devices are within the same rack or adjacent racks, passive or active 800G DACs are optimal due to simplicity, low cost, and minimal latency .
- Measure the exact distance between endpoints to determine whether passive DAC suffices or if an active solution is needed .
- Consider connector compatibility with existing switches and NICs to ensure seamless integration .
- Plan for future scalability, as 800G DACs can support upgrades to 1.6T networks with minimal infrastructure changes .

Summary

For island or isolated high-speed deployments, 800G DAC cables provide the best balance of performance, cost, and simplicity for short-distance connections. Use passive DACs for under 2 meters, active DACs or AECs for 2-5 meters, and reserve AOCs for longer links. Proper planning of distance, connector type, and power considerations ensures reliable, low-latency, and cost-efficient 800G interconnects .

Article Content

A Comprehensive Guide to 800G Ethernet DAC Cables

This guide systematically analyzes the definition, direct connection and branching forms, application scenarios and

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A Comprehensive Guide to 800G Ethernet DAC Cables

This article will introduce the definition, product form, and application scenarios of 800G Ethernet DACs to gain a

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