

Selection Guide for PAM4 SFP Optical Modules for Oil and Petrochemical Applications



Overview

This guide consolidates authoritative guidance and practical criteria—compatibility, data rate and form factor, fiber & wavelength, link budget, environmental ruggedness, digital diagnostics (DDM), and vendor quality—so network engineers and procurement teams can choose with. This guide consolidates authoritative guidance and practical criteria—compatibility, data rate and form factor, fiber & wavelength, link budget, environmental ruggedness, digital diagnostics (DDM), and vendor quality—so network engineers and procurement teams can choose with. Broadcom's Optical Module PHY portfolio spans multiple technology nodes — 16nm, 7nm and now 5nm, with data rates from 100 Gbs to 1. Comprising five flagship platforms, Centenario, Jesko, Portofino, Gemera, and Cygnus, Broadcom's DSP PAM-4 portfolio covers 100G, 400G, 800G, and 1.6T PMDs. We provide an industrial-grade reference framework, complying with the latest MSA (Multi-Source Agreement) updates, including SFF-8679 Rev 1.4 (Jan 2025), to help you design robust, scalable optical fabrics. The Master Reference Matrix: SFP vs.

Thus, according to the single-channel rate, 800G transceivers. A key new modulation scheme, PAM4, was introduced around 2017 and enabled the big jump from 100G to 400G. When it comes to enabling 400G and higher Ethernet speeds, a four-level pulse amplitude modulation or PAM4 multilevel signaling is needed as opposed to the non-return-to-zero (NRZ) modulation. The 100G-DR-LPO specification by the LPO (Linear Pluggable Optics) MSA defines 100 Gb/s/lane 53. 125 GBd PAM4 optical interfaces, optical links using standard single-mode fiber with up to 500 m reach, and host-module electrical interfaces for hosts with DSP based SerDes and RS(544,514) FEC.

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Understanding the difference between electrical port rate and optical port rate, along with the impact of modulation techniques like PAM4, helps in selecting the right module.



In this blog, we take a higher-level look at PAM4, the modulation scheme that makes short distance 400G networking possible, and discuss how this technology has enabled big leaps in optical ...



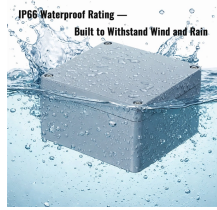
Read the definitive 2026 guide on SFP modules. We explain Single Mode vs Multimode, DDM diagnostics, and how to choose the right transceiver for Cisco, Juniper, and more.



The definitive guide to SFP, QSFP, and QSFP-DD standards for 2025. Compare 400G/800G optics, understand PAM4 complexity, and master QSFP-DD vs OSFP deployment ...



MaxLinear's highly integrated PAM4 DSPs offer superior link-margin performance and low power to enable 100G, 400G, 800G, and 1.6T optical interconnects inside the data center. Filter your results ...



It builds on IEEE 802.3 and OIF CEI-112G-LINEAR-PAM4 specifications. It enables Ethernet-like links with 1, 2, 4, or 8 lanes for data centers, using low power, high port density, low cost, and low latency ...



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The Marvell Spica PAM4 DSP is a next generation solution for cloud data center, high-performance computing, and AI optical transceivers. Spica supports multiple industry standard protocols up to ...



In this article, we will provide an overview of the various types of 800G optical modules, discuss their applications, and address some FAQs to help you make a better choice when selecting ...



Broadcom's Active Copper PHY portfolio enables DAC cable providers to build very low insertion-loss profile, ultra-low latency, ultra-low power cables for 100G/400G/800G/1.6T hyperscale/AI networks ...

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