PAM4 Selection Guide for Supercomputing Center-Grade Optical Modules

Overview

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 . The Marvell® PAM4 optical DSP portfolio, including Spica™ and Nova™ DSPs, addresses the critical the need for high-bandwidth optical interconnects to power AI infrastructure. Marvell leads the pluggable module ecosystem with low-power, high-performance silicon for AI, cloud, enterprise and 5G. While SFP+ (10G) and SFP28 (25G) used NRZ (Non-Return to Zero) modulation, SFP56 utilizes PAM4 (Pulse Amplitude Modulation 4-level). Implication: You cannot plug an SFP56 module into an SFP28 port and expect it to auto-negotiate 50G without specific host support for PAM4 decoding. 2025 Update: Most. PAM4 is a branch of the pulse amplitude modulation (PAM) technology, which is a mainstream signal transmission technology following non-return-to-zero (NRZ). Figure 1-1 shows the typical waveform. hat enables next generatio out the prior written consent of MaxLinear, Inc. MaxLinear, the MaxLinear logo, and any other MaxLinear trademarks (including but not limited to MxL, Full-Spectrum Capture, FSC, AirPHY, Puma, and AnyWAN, VectorBoost, MXL WARE, and Panther) are all property. By a limited introduction of HOM in Client Side modules, e. by using PAM4 with linear components and direct detection, we can minimize the increase of testing complexity, and thus cost, inherent to HOM.

Article Content

400G 100G-PAM4 OSFP & QSFP112 Optical Modules by ETU-LINK

Enhance your network with high-speed NVIDIA 400G and 100G-PAM4 OSFP and QSFP112 optical modules, designed for optimal performance and maximum efficiency in switch

A Complete Guide to Selecting 100G QSFP28 Optical

Choose the best 100g qsfp28 optical transceiver for your network by comparing compatibility, distance, fiber type, and future-proofing options.

PAM4 Modulation | How is Transforming Optical

Short-distance 400G networking is made possible by PAM4 modulation scheme, which is set to revolutionize optical networking.

50G PAM4 Technical White Paper

The optical components and chips of PAM4 modules are very different from those of NRZ modules. The following table lists the differences between 50G QSFP28 LR and 25G SFP28 LR.

PAM-X™: A 25Gb/s-PAM4 Optical Transceiver Chipset for 5G Optical

A complete 25Gb/s PAM4 optical transceiver chipset using commercial 10G-lasers for 10km single-mode fiber is presented. Measurement results demonstrate <−12dBm sensitivity across all temperatures

The Most Comprehensive Guide Of Optical Modules

Explore the ultimate guide to optical modules. Learn types, functions, performance metrics & how to choose the right module for your fiber network.

Analog PAM4 Chipset Delivers DSP-Level Performance

Manufacturers of advanced modules for hyperscale data center applications can reduce power, latency and cost with the industry''s first analog

100G DSFP Modulation Explained: NRZ to PAM4 Evolution

Explore how PAM4 modulation enables 100G DSFP optics, why NRZ reached its limits, and how modern DSP-driven designs deliver high-density, scalable optical interconnects.

100 Gbps Optical Modules

MACOM delivers industry widest portfolio of chip-sets for 100Gbps (4x28Gbps) optical modules. These devices are typically used with VCSEL lasers and Photodectors for optical transmission over multi

GIGALIGHT Launches Industrial-Grade 50G SFP56 PAM4 Portfolio

After several months of rigorous client testing and trials, GIGALIGHT has successfully developed a full range of industrial-grade 50G SFP56 PAM4 optical modules and plans to put them

PAM4 DSPs, TIAs and Drivers Enable Next-Gen Fiber-Optic Modules

MaxLinear provides a full range of PAM4 DSPs and TIAs for applications ranging from 100G to 1.6T, supporting 50G/lane, 100G/lane, and 200G/lane options on both the host and line side interfaces for

Source Photonics'' telecom-grade 400G QSFP-DD and 100G QSFP28 PAM4 ...

“This is a well-deserved recognition for a company that has long been at the forefront of optical transport technology and we take great pride that the company selected the Marvell Porrima

100G to 1.6T Optical Module PHY Product Selection Guide

Broadcom''s 5nm PCIe and CXL PHY portfolio offers industry''s lowest power, lowest latency and best performing retimer products, enabling Data Center Server and Storage manufacturers to build most

A Complete Guide to Selecting 100G QSFP28 Optical

Choosing QSFP28 optical transceivers that fit your system helps your network work well and keeps your money safe. This definitive guide cuts through

The Ultimate Reference Table for SFP & QSFP Optical Transceiver ...

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

800G Client Optics in the Data Center

The vast data centers used by cloud service providers have thousands of identical racks of servers and networking equipment. When hyperscale data center operators start deploying a new generation of

Analysis of 400G OSFP SR4 Optical Module

The 400G OSFP SR4 optical module, with its innovative design, is redefining the performance limits of short-reach optical interconnects. As the new

First 800Gbps PAM4 Electro-Optics Platform for Mega

High-speed data movement interconnects expert, Inphi, has announced the sampling of its new Spica 800G 7nm PAM4 DSP, the world''s first

PAM4 Modulation | How is Transforming Optical

In this blog, we take a higher-level look at PAM4, the modulation scheme that makes short distance 400G networking possible, and discuss how

MaxLinear announces 5nm CMOS PAM4 DSP with

“Our 5nm Keystone PAM4 DSP with integrated VCSEL drivers addresses the demands of this key market, enabling best-in-class power

Marvell Ara PAM4 Optical DSP

The Marvell Ara PAM4 DSP is a next generation solution for GenAI and cloud datacenter interconnects utilizing pluggable transceivers. Ara features eight 200Gbps/channel PAM4 host electrical interfaces,

PAM4 Optical DSPs | Enabling high-bandwidth optical

The Marvell® PAM4 optical DSP portfolio, including Spica™ and Nova™ DSPs, addresses the critical the need for high-bandwidth optical interconnects to power

Optical & IC Products

For our optical component and module customers, this highly differentiated set of products provides a unique roadmap that improves performance and reliability, while simplifying design, lowering costs

PAM4 Design Challenges and the Implications on Test

The Infiniband standard provides electrical and optical links between supercomputing equipment. PAM-4 proposals are being discussed that would support 400 GbE

Opportunities for PAM4 modulation

To enable a quick time to the market a 8x50Gbps / 56Gbps PAM4 architecture, using mature 25Gbps / 28Gbps platforms and leveraging the technology of 100GbE generations, may be a promising

PAM4 Signaling for intra-data center and Data center to data center ...

A PAM4-OCDM system with optical multi-/demultiplexing and electrical pre-/post-processing is proposed for short-reach applications. We experimentally demonstrate, for the first

Contact Us

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