

Quality Guaranteed Active Optical Devices NRZ



Overview

Thorlabs' collection of components and systems below are designed to actively manipulate the properties of input light.

Key Takeaways

Active optical devices using NRZ modulation provide reliable high-speed data transmission up to 200Gbps with compliance to industry standards and environmental robustness. Overview of NRZ Active Optical Devices

NRZ (Non-Return-to-Zero) modulation is widely used in optical transceivers and active optical cables (AOCs) for high-speed data communication. These devices convert electrical signals into optical signals and are designed for data center, enterprise, and telecom applications. NRZ devices are valued for their simplicity, low power consumption, and compatibility with standard protocols.

Key Types and Specifications

- SCFF 1-TRX Transceivers
- Small Cubical Form Factor (SCFF) 1-channel duplex multimode transceivers.
- Operate at 10Gbps and 25Gbps using NRZ modulation.
- Rugged design for harsh environments with a height under 10mm for compact PCB integration.



- Chip-on-board technology with VCSEL drivers, TIA, VCSEL, and PIN diodes ensures high reliability and performance.
- Supports multiple protocols including 10GbE, 25GbE, and Fiber Channel (8G/16G/32G) for 25Gbps versions (Amphenol) .
- QSFP28 and QSFP-DD Active Optical Cables
- QSFP28 AOCs: Intel-compatible, 100Gbps (4x25Gbps NRZ) over multimode fiber, hot-pluggable, RoHS compliant, lightweight, and slim for easy cable management .
- QSFP-DD AOCs: 200Gbps (8x25Gbps NRZ), doubling port density compared to QSFP28, backward compatible with QSFP modules, supporting up to 100 meters over parallel multimode fiber .
- Ideal for high-capacity networks and data center interconnects.
- High-Speed Optical Transmitters
- Devices like the SHF 5003 NRZ optical transmitter convert electrical signals to optical signals up to 50Gbps.
- Utilize chirp-free Mach-Zehnder modulators with optimized amplifiers for stable optical output.
- Include built-in 1550nm DFB lasers with PM fiber loops and remote control via GPIB for precision applications .

Quality and Compliance

- These devices are fully certified to meet international safety and quality standards, including RoHS and REACH compliance, ensuring environmental safety and reliability .

- Ruggedized designs and advanced chipsets provide high stability, low signal distortion, and long-term operational reliability in demanding environments .

Applications

- Data Centers: High-speed interconnects between racks and servers.
- Telecommunications: Reliable optical links for enterprise networks.
- High-Performance Computing: Low-latency, high-bandwidth connections.
- Harsh Environments: Rugged transceivers for industrial or outdoor deployments.

Summary

NRZ-based active optical devices offer a combination of high-speed performance, environmental robustness, and compliance with industry standards, making them suitable for modern data communication needs. From compact SCFF transceivers to high-capacity QSFP-DD AOCs, these devices ensure quality-guaranteed optical connectivity for demanding applications.

Article Content

Kyrgyzstan Quality Assurance Active Optical Devices NRZ

ISO 13485 Certification Consulting Services in Kyrgyzstan Get ISO 13485 consulting in Kyrgyzstan for medical device compliance,

Luxembourg Active Optical Devices NRZ

This application note covers how to decouple a framer from the line interface unit (LIU) so that the user can connect the LIU/framer to

Silicon Photonics Platform for 50G Optical Interconnects

PAM-4 acceptable for long links, but NRZ modulation preferred for short, latency sensitive links At 50Gb/s channel speed,

Active Optics Cable Assemblies | TE Connectivity

Our active optical cable assembly portfolio provides greater cable flexibility and longer reach, as compared to both traditional passive

100G QSFP28 To 4x 25G SFP28 Active Optical Cables 4x25G NRZ,

FIBERSTAMP 100G QSFP28 to 4x 25G SFP28 AOC active optical cable is used for short-distance interconnection between devices

Active Optical Devices

Thorlabs' collection of components and systems below are designed to actively manipulate the properties of input light.

Lebanon s Active Optical Devices NRZ

In this presentation, we report 1-bit memory operation of 20-Gb/s RZ signals and 40-Gb/s non-return-to-zero (NRZ) signals using a

Active Optics Cable Assemblies | TE Connectivity

Greater cable flexibility and longer reach Our active optical cable assembly portfolio provides greater cable flexibility and longer

Optical & IC Products

Optical & Copper IC Products Semtech designs the industry's most innovative optical, analog and mixed-signal semiconductor

Active Components for 50 Gb/s NRZ-OOK Optical Interconnects in a ...

We present active components developed in imec's silicon photonics platform that enable 50-Gb/s non-return-to-zero

A Comparative Analyses for NRZ and RZ to the Best ...

A NRZ properties (B) RZ properties 2.2 Data carrier medium :-This part consists of an fiber optical cable that

NRZ to PAM-4: 400G Ethernet Evolution | Synopsys IP

Discover the benefits and trade-offs of transitioning from NRZ to PAM-4 signaling for improved 400G Ethernet data rates.

PAM4 vs NRZ in Optical Communication: What's the Difference?

Understanding NRZ and Its Role in Optical Communication Non-Return-to-Zero (NRZ) is one of the most traditional

Understanding FEC and Its Implementation in Cisco Optics

Our Active Optical Cables (AOCs) are not based on an industry optical specification for the link, because they form a

Active Optical Devices Market Research Report 2034

The Active Optical Devices market was valued at \$6.57 billion in 2025 and is projected to reach \$15.29 billion by 2034, growing at

Quality of Service (QoS) improving schemes in optical networks

This paper presents state of the art of Quality of Service (QoS) schemes used for improving the performance of optical

All-optical NRZ-OOK-to-RZ-OOK format conversions with tunable duty ...

Several approaches have been proposed to demonstrate all optical NRZ-OOK-to-RZ-OOK format conversion, including

AOC (Active Optical Cable) : Optical Transceiver Module | NEC

AOC (Active Optical Cable) Active Optical Cables (AOC) use optical fibers, allowing for longer distance transmission compared to

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

