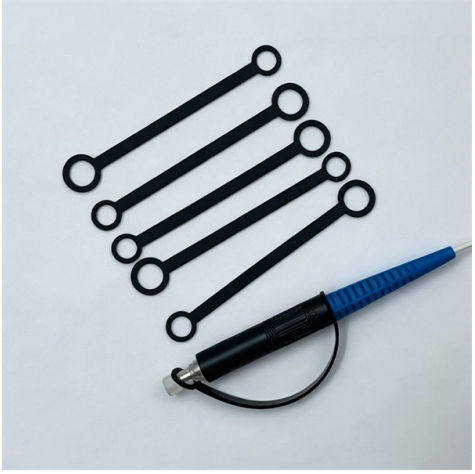
Optical Module KR Mode



Overview

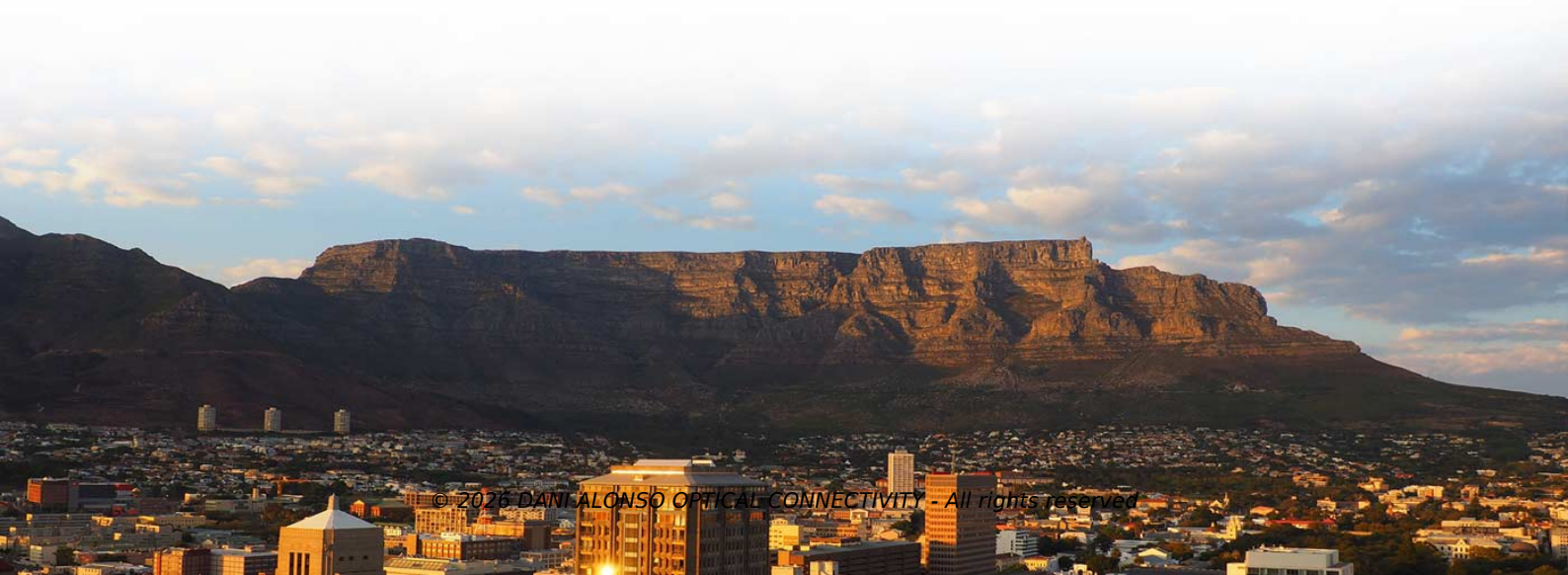
10GBASE-KR Transceiver datasheet (Rev The high speed side is ideal for interfacing with remote systems through optical fibers, electrical cables, or backpl.

Key Takeaways

KR mode refers to Ethernet backplane operation where data is transmitted over electrical traces using 64b/66b encoding, often interfacing with optical modules via SerDes for high-speed communication.Overview of KR Mode

KR mode is a backplane Ethernet standard defined by IEEE, where "K" indicates a backplane connection and "R" specifies the use of 64b/66b encoding for data transmission . It is commonly used in high-speed Ethernet applications such as 10GBASE-KR, 25GBASE-KR, and 100GBASE-KR4, enabling reliable communication over PCB traces or copper backplanes within servers, switches, and networking devices . KR mode is designed for point-to-point links and supports auto-negotiation and Forward Error Correction (FEC) to maintain low bit error rates .

KR Mode in Optical Modules



While KR mode primarily refers to electrical backplane signaling, it can interface with optical modules through a SerDes Framer Interface (SFI). In this setup, the FPGA or host transceiver serializes parallel data and sends it to the optical module, which converts the electrical signal into an optical signal via the Transmitter Optical Sub-Assembly (TOSA). The receiving side uses a Receiving Optical Sub-Assembly (ROSA) to convert the optical signal back into electrical form for deserialization . This allows KR-mode transceivers to work seamlessly with SFP+ or QSFP optical modules for high-speed Ethernet links .

Key Features

• Encoding: KR mode uses 64b/66b encoding, which reduces overhead and improves data integrity over high-speed links .

• FEC Support: Forward Error Correction, such as BASE-R or RS-FEC, is often required to correct errors caused by channel noise or PCB trace losses .

• SerDes Interface: KR mode relies on serializer/deserializer (SerDes) circuits to convert parallel data to serial streams and vice versa, enabling high-speed transmission over both electrical and optical media .

• Auto-Negotiation: KR mode supports auto-negotiation to determine link speed, FEC mode, and other capabilities between link partners .

Applications

KR mode is widely used in:

• 10GBASE-KR: 10 Gbps Ethernet over backplane traces, often interfacing with SFP+ optical modules .

• 25G/50G Ethernet: High-speed server interconnects using KR electrical lanes with optional optical breakout .

• 100GBASE-KR4: Four-lane 25 Gbps per lane backplane Ethernet, commonly used in switches and high-performance computing systems .

Summary

KR mode enables high-speed, reliable Ethernet communication over backplanes while allowing integration with optical modules for longer-distance or fiber-based links. It combines 64b/66b encoding, SerDes interfaces, FEC, and auto-negotiation to ensure robust data transmission in modern networking equipment .

Article Content

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