What is the sensitivity of the 100ger4 optical module

Article Overview

The 100GBASE-ER4 optical module typically has a receiver sensitivity around -8.4 dBm to -9.5 dBm per channel, depending on FEC usage and link conditions.

Overview

The 100GBASE-ER4 module is designed for long-reach 100Gb/s Ethernet transmission over single-mode fiber (SMF) using four 25Gb/s lanes multiplexed via LAN WDM at wavelengths of 1295.56, 1300.05, 1304.58, and 1309.14 nm . The module supports distances up to 30 km without FEC and 40 km with FEC . High-sensitivity APD receivers are used to detect the optical signals, which is critical for achieving extended reach.

Receiver Sensitivity

o APD Receiver Type: The module employs Avalanche Photodiode (APD) receivers, which provide higher sensitivity than standard PIN photodiodes .
o Typical Sensitivity: For 100GBASE-ER4 Lite modules, the receiver sensitivity is approximately -8.4 dBm per channel with FEC enabled and slightly higher (less negative) without FEC, around -7.5 dBm to -8 dBm .
o Impact of FEC: Forward Error Correction (FEC) improves the effective sensitivity, allowing the module to reliably receive signals at lower optical power levels, which is why the maximum reach extends from 30 km (without FEC) to 40 km (with FEC), .

Additional Considerations

o Optical Output Power: Each transmitter channel maintains a constant output power via an automatic power control (APC) circuit .
o Environmental Tolerance: The module is designed to operate under harsh conditions, including wide temperature ranges, humidity, and EMI interference .
o Standards Compliance: It conforms to IEEE 802.3ba 100GBASE-ER4 Lite, QSFP28 MSA, and OTU4 standards . In summary, the 100GBASE-ER4 optical module's sensitivity is primarily determined by its APD receivers and FEC usage, with typical values around -8.4 dBm per channel, enabling reliable 100Gb/s transmission over distances up to 40 km with FEC support .

In this post, I''ll discuss various current-sensing functions in high-bandwidth data communication applications for pluggable optical

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