40km optical module light reception threshold



Overview

SFP+ 40km (10GBASE-ER): Extended-Reach Optical Module GuideUnderstand SFP+ 40km (10GBASE-ER) modules, including specs, SMF compatibility, and how to choose.

Key Takeaways

For a 40km single-mode optical module, the typical receiver sensitivity is around -18 dBm, with a maximum safe receive power of approximately -3 to -2. 3 dBm.

Receiver Sensitivity and Thresholds

A 40km optical module, such as a 40GBASE-ER4 QSFP+, is designed for long-reach single-mode fiber transmission. The receiver sensitivity (minimum optical power required for error-free operation) is typically around -18 dBm, while the maximum safe receive power is usually -3 dBm to -2. 3 dBm to prevent damage to the photodiode or avalanche photodiode (APD) in the module.

This defines the dynamic range of the module, which is the difference between the maximum and minimum acceptable optical power, often around 20 dB for 40km modules.

Practical Considerations

Overload Protection: If the received optical power exceeds the maximum threshold, it can permanently damage the receiver, reduce sensitivity, or increase bit error rates.

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Short-

Distance Connections: When connecting a 40km module over a short fiber (e.g., 10km), the received power may exceed the safe limit. In such cases, an optical attenuator is recommended, typically ≥10 dB, to reduce the power to a safe level. Monitoring: Use an optical power meter to measure the received power before connecting the module.

Ensure the R

X power is below the maximum threshold (e.g., less than -4 dBm for long-term stability) to avoid damage. Summary of Typical Values for 40km ModulesParameterTypical ValueReceiver Sensitivity-18 dBmMaximum Receive Power-3 to -2. 3 dBmDynamic Range~20 dBRecommended Attenuator for Short Links≥10 dBBy maintaining the received optical power within this range, a 40km optical module can operate reliably, ensuring stable high-speed data transmission over long distances without risking damage to the receiver components.

Article Content

SFP+ 40km (10GBASE-ER): Extended-Reach Optical Module Guide

Understand SFP+ 40km (10GBASE-ER) modules, including specs, SMF compatibility, and how to choose the right extended-reach optical transceiver for your network.

10GBASE-ER SFP+ Transceiver Datasheet | FS

10Gb/s Pluggable SFP+ transceivers are Enhanced Small Form Factor Pluggable SFP+ transceivers designed for use in 10-Gigabit multi-rate links up to 40km of G.652 single mode fiber.

40GBASE-ER4 QSFP+ 1310nm 40km Transceiver Datasheet | FS

With a comprehensive line of original-brand switches, we can recreate an environment and test each optics in practical application to ensure quality and distance.

100 Gb/s 40 km QSFP28 ER4 Transceiver

This product is designed with form factor, optical/electrical connections, and digital diagnostic interface according to the QSFP28 Multi-Source Agreement (MSA) and compliant to IEEE

SFP Distance Explained: Real-World Range, Limits, and Optics

Understand SFP distance, fiber optic range, and real-world limits of SR/LR modules. Learn how wavelength, fiber type, and optics affect performance.

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100G QSFP28 4WDM-40 DML 40km Optical Transceiver

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM).

100 Gb ER4 Lite 40 km QSFP28 Module

To determine achievable distances, refer to the device''s optical specifications and to the specific characteristics of your fiber installation. The following table lists specifications for the 100 Gb ER4

Product Specification SFP 1G 40km LC Transceiver

1000BASE-ZX and Fiber Channel 1x SM-LC-L FC-PI. It is with the S P 20-pin connector to allow hot plug capability. This module is designed for single mode fiber nd operates at a nominal wave length

10Gb/s SFP+ CWDM Transceiver, Single Mode, 40km Reach

FEATURES Supports up to 11.3Gbps bit rates Hot-Pluggable SFP Footprint and Single LC Connector CWDM DFB laser and PIN photodiode, Up to 40km Compatible with RoHS Single +3.3V power

40G QSFP+ ER4 40km Optical Transceiver

It is compliant with the QSFP+ MSA, IEEE 802.3bm 40GBASE-ER4, and OTU3 requirements. The Gigalight technology enables the integration of 4 transmitters, 4 receivers and an optical

What Is an Optical Module and Its FAQs (V200)

What Is an Optical Module and Its FAQs (V200) Describes what an optical module is and FAQs, including the fundamentals, appearance and structure, key performance counters, common types,

Solved: Understanding TX RX light level

Hi, I hope someone could please help clarify TX and RX light level. This is the information i got from the CLI of cisco router: Optical Optical Temperature Voltage Current Tx Power Rx Power

Introduction to Optical Fibers, dB, Attenuation and Measurements

This document is a quick reference to some of the formulas and important information related to optical technologies. This document focuses on decibels (dB), decibels per milliwatt (dBm),

Optical: Power and Calculating Loss on a Fiber Span

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Overview Optics have thresholds for how strong or weak of a light level they can receive before they''ll theoretically fail The purpose of this page is to help estimate if a particular optic will

Optical Module Performance: Key Power and Sensitivity Metrics

In modern optical communication systems, optical modules serve as the core photoelectric conversion components whose performance metrics directly impact the efficiency and

SFP-10G-ER Explained: Powering 40km 10Gbps Optical Links

SFP-10G-ER is a 10G SFP+ transceiver for up to 40km over single-mode fiber, featuring 1550nm wavelength, LC connector, and real-time monitoring.

QSFP28 100G ER4 Optical Module:Technologies and Applications for 40km ...

QSFP28 100G ER4 optical module, with its compact design and robust 40km transmission capability, has emerged as a core component enabling high-performance network expansion.

40Gbps QSFP ER4 Optical Transceiver Module AQSFP-40G-ER4

The receiver module accepts the 40Gb/s CWDM optical signals input, and de-multiplexes it into 4 individual 10Gb/s channels with different wavelength. Each wavelength light is collected by a discrete

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

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