What quota should be applied to gigabit single-mode optical modules



Overview

Learn how to choose the right 1G SFP module for your network. Our guide covers compatibility, distance, fiber type, cost, and vendor selection for optimal performance.

Key Takeaways

For gigabit single-mode optical modules, the optical power quota (link budget) typically ranges from 5 dB to 21 dB depending on module type and fiber span, with inline attenuators recommended for short links to prevent receiver overload. Recommended Optical Power Quotas1000BASE-LX/LH SFP: Designed for standard single-mode fiber, supporting spans up to 10 km. For shorter distances, a 5 dB inline optical attenuator may be used to prevent overloading the receiver.

1000BASE-EX SFP: Supports spans up to 40 km. A 5 dB inline attenuator is recommended for back-to-back connections or when the fiber loss is very low. 1000BASE-ZX SFP: Supports spans up to 70 km with an optical link budget of 21 dB.

For shorter distances where the fiber loss is less than 8 dB, a 10 dB inline attenuator should be inserted to avoid receiver saturation.

Factors Affecting Quota Selection

Fiber Type and Quality: Single-mode fiber compliant with ITU-T G. 652 is standard for 1310 nm and 1550 nm wavelengths. Fiber attenuation, splices, and connectors influence the required optical power margin.

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Distance: Shorter links may require inline attenuators to reduce optical power at the receiver, while longer links rely on the module's maximum output power and fiber loss to maintain signal integrity. Module Type: BiDi SFPs require matched TX/RX wavelengths, and their link budget must account for the single-fiber configuration. Environmental Factors: Temperature variations and fiber bending can affect attenuation, so a safety margin is recommended in the link budget.

Practical Guidelines

Always consult the SFP datasheet for maximum and minimum optical power levels. Use inline optical attenuators when the calculated received power exceeds the module's maximum input specification. For network design, consider statistical or worst-case link budgets to accommodate fiber aging, splices, and connectors.

Ensure compatibility with existing fiber infrastructure and verify that the selected SFP module supports the intended distance and wavelength. By following these guidelines, network engineers can ensure reliable 1 Gbps transmission over single-mode fiber while preventing receiver overload and maintaining signal integrity.

Article Content

Recommendation ITU-T G.652 (08/2024)

This document outlines the specifications for a single-mode optical fiber and cable designed for use around the 1310 nm zero-dispersion wavelength, suitable for both the 1310 nm and 1550 nm regions,

Ultimate Guide to 1G SFP Module Selection

Learn how to choose the right 1G SFP module for your network. Our guide covers compatibility, distance, fiber type, cost, and vendor selection for optimal performance.

Cisco SFP Modules for Gigabit Ethernet Applications Data Sheet

This data sheet describes the benefits, specifications, and ordering information for the Cisco SFP Modules for Gigabit Ethernet Applications.

Gigabit SFP Module: A Complete Guide to 1G SFP Transceivers

This guide focuses on what a gigabit SFP module is, how it works, the main types available, and how to choose the right one for your network.

IEEE 802.3 Single-mode Optical Fiber Ethernet Standards

Desired data rate and operating range are the primary considerations when planning a single-mode optical fiber infrastructure capable of supporting multiple generations of Ethernet applications.

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Recommendation ITU-T G.652 (08/2024)

This Recommendation describes a single-mode optical fibre and cable which has zero-dispersion wavelength around 1310 nm and can be used in the 1310 nm and 1550 nm regions.

Cisco SFP Modules for Gigabit Ethernet Applications

The 1000BASE-ZX SFP operates on standard single-mode fiber-optic link spans of up to approximately 70 km in length. The SFP provides an optical link budget of 21 dB, but the precise link span length

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.

Expanding Singlemode Fiber Capabilities in Ethernet Applications

IEEE 802.3cu Standard defines a cost-effective, more power-efficient approach for achieving 100 Gb/s and 400 Gb/s Ethernet networking.

The Ultimate Guide to 1G SFP Modules

In this comprehensive guide, we delve into the world of 1G SFP modules, providing a complete understanding of their functionality, types, and applications.

What is a 100 Gigabit Singlemode SFP-FE-LX Optical Module?

The 100 Gigabit Singlemode Optical Module SFP-FE-LX is an optoelectronic converter module with SFP interface, supporting 100 Gigabit Ethernet standard and transmission distance up

100G Optical Module Selection Guide: Advantages and Types of

Explore the QSFP28 100G optical module, a vital component for high-speed network connections. Discover its unique features, advantages, and various types to meet diverse

How to Set Up Quota Arrangement in SAP – A Step-by-Step Guide

Quota Arrangement is a strategic approach to ensure fair and efficient vendor allocation, helping teams meet objectives without overburdening any single unit. Whether you''re managing

SFP Single Mode LC Module (20km)

TRENDnet''s SFP Single Mode LC Module, model TEG-MGBS20, is compatible with standard SFP slots found on network switches and fiber media converters. Each TEG-MGBS20 single mode fiber SFP is

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Quota Arrangement in SAP S/4HANA Cloud

This blog post should help you to understand in detail about Quota Arrangement in SAP S/4HANA Cloud. Thanks for reading this blog post, hopefully the blog post was informative.

1G SFP LX 1310nm 20km Single mode Transceiver

Generic SFP-1G-LX Compatible 1000BASE-LX/LH SFP 1310nm 10km-20km Transceiver supports 1G gigabit Ethernet throughput over singlemode fiber (SMF) with LC connector.

Cisco SFP Modules for Gigabit Ethernet Applications

1000BASE-EX SFP for long-reach single-mode fibers The 1000BASE-EX SFP operates on standard single-mode fiber-optic link spans of up to 40 km in length. A 5-dB inline optical attenuator should be

ITU-T Rec. G.652 (11/2009) Characteristics of a single-mode optical ...

Characteristics of a single-mode optical fibre and cable Summary Recommendation ITU-T G.652 describes the geometrical, mechanical and transmission attributes of a single-mode optical fibre and

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

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