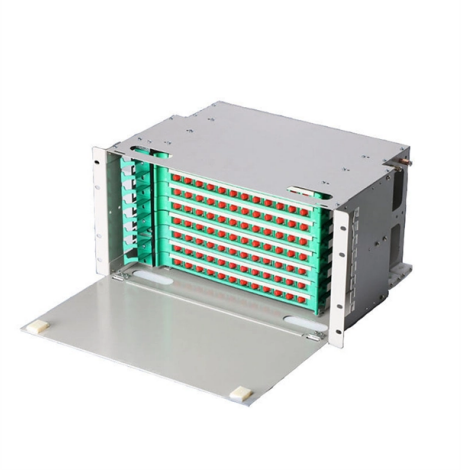
Customization Process for Low-Loss MEMS Optical Switches in Backbone Networks



Article Overview

Low-loss MEMS optical switches are customized through careful design of MEMS actuators, optical alignment, and fabrication processes to achieve minimal insertion loss and high reliability in backbone networks.

Overview of MEMS Optical Switches

MEMS (Micro-Electro-Mechanical Systems) optical switches use arrays of microscopic mirrors to redirect light between fibers without optical-electrical-optical conversion, preserving signal integrity and minimizing latency . These switches are highly scalable, with configurations ranging from 1x16 to large-scale 240x240 or beyond, and are increasingly used in backbone networks for dynamic routing, protection switching, and optical path restoration .

Key Customization Steps

1. Design of MEMS Actuators and Mirrors Customization begins with selecting the appropriate actuator type, typically electrostatic or piezoelectric, and designing mirrors with high surface quality to minimize scattering and insertion loss . Pure-flexure designs are often used to avoid mechanical contact, reduce wear, and maintain precise mirror positioning . Residual stress engineering ensures that mirrors and beams remain stable under actuation, preventing buckling or nonlinear displac...

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Section I introduces two typical designs for MEMS optical switch matrices and Section II aims to discuss some typical and unique

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Use our custom MEMS optical switches in applications that require continual switching, where their high-reliability and long-lifetimes

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While multiple technologies can be used to build optical switches, MEMS-based switching provides a unique

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Techniques in the Design and Fabrication of Optical MEMS Switches

Optical switching becomes more and more an important issue in optical communication networks as the networks develop from static

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MEMS Optical Switch: Technology Guide, Specifications & OXC

What Is a MEMS Optical Switch? A MEMS (Micro-Electro-Mechanical Systems) optical switch uses microscopic mirrors fabricated on

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Mechano-optically co-designed highly-scalable silicon photonic MEMS ...

Mechano-optical co-design of the quasi-buckling-free HADC MEMS switch Figure 1a shows the schematic

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