

Domestic production of optical module housings



Overview

Optical Housings Optomechanical components like optical housings require a very tight fit between the cells' OD and the barrels' ID.

Key Takeaways

Domestic production of optical module housings is rapidly expanding, driven by policy support, technological breakthroughs, and growing demand from AI, 5G, and data center applications. Market Drivers and Policy Support

The push for domestic production is fueled by both government policies and market demand. National initiatives, such as the Ministry of Industry and Information Technology's guidelines on manufacturing reliability, explicitly support the localization of optical communication devices, encouraging collaboration between industry, academia, and research institutions . Projects like "East Data West Computing" create massive demand for domestic data center infrastructure, directly boosting the need for locally produced high-speed optical modules . Domestic manufacturers benefit from cost advantages, faster technical support, and supply chain resilience, reducing reliance on imports .

Technological Advancements



Domestic manufacturers have achieved significant technological breakthroughs in optical module production. Low-speed optical chips (2.5G/10G) now have localization rates of 90% and 60%, respectively, while high-speed modules like 100G QSFP28 ZR4 and 25G SFP28 BIDI demonstrate performance comparable to international standards . Innovations include:

- Single-fiber bidirectional transmission to reduce cabling costs for 5G fronthaul networks .
 - Silicon photonics and co-packaged optics (CPO) for higher speeds, lower power consumption, and integration with switch ASICs .
 - Mass production of 100G optical chips, including high-speed lasers (DFB/EML) and photodetectors (PIN/APD), enabling reliable module assembly and deployment .
- These advancements support a complete domestic supply chain, from chip design and fabrication to module assembly and testing, ensuring high-quality optical module housings for various applications.

Market Trends and Applications

The domestic optical module market is expanding rapidly, with data centers accounting for the largest share of demand, followed by telecommunications and automotive applications . The growth is driven by:

- AI and cloud computing workloads, requiring high-speed, low-latency optical modules .
- 5G network deployment, increasing demand for cost-effective and high-performance modules .
- Automotive LiDAR and V2X communication, contributing to a 30% growth in optical module demand in 2023 . China currently produces over 70% of global optical modules, with major hubs in Shenzhen and Suzhou, and domestic manufacturers are increasingly competitive in high-speed segments like 400G and 800G modules .

Future Outlook

The domestic production of optical module housings is expected to focus on:

- Speed upgrades: 800G modules becoming mainstream, with 1.6T/3.2T commercialization accelerating.
- Independent control: Localization of high-end optical chips and DSP chips to achieve full autonomy.
- Scenario expansion: New applications in automotive, satellite internet, and AI data centers, creating a second growth curve . Overall, domestic production is transitioning from import substitution to global competitiveness, with technological innovation, policy support, and market demand driving the expansion of optical module housings in China.

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OSFP Housing Standard 800G OSFP Module Case

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Application Of Die-Casting In Optical Module Housing

The process allows for the production of intricate designs with tight tolerances, which is crucial for the functionality and

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