MOC Optical Connector

Dual-Alignment、Soft mating、Ultra-small multi-fiber connector

ARRAYEDFIBEROPTICS

莱塔思光学 Litas Optical Technologies

Working Principle

I. Serious mechanical design flaw of existing MPO fiber optic connectors: only primary alignment, no secondary alignment.

A basic principle in mechanical design is that passive alignment between mechanical structures requires a two-stage alignment mechanism: coarse alignment and fine alignment. However, the MPO connector, which relies on passive alignment, provides only fine alignment (via guide pins and guide holes) and lacks coarse alignment. As a result, during MPO connector mating, the initial positional offset between the two MT ferrules is often very large, leading to a variety of performance issues.

II. The dual-alignment of MOC connector

The structure of the MOC ultra-compact multi-fiber connector is as follows (Figure 1):

The MT ferrule protrudes from the MOC connector to the maximum extent. During mating, it is compressed back to its final position. Therefore, the initial spring mating force of the MT ferrule is very small, and the fiber end faces are not prone to impact damage or scratching.

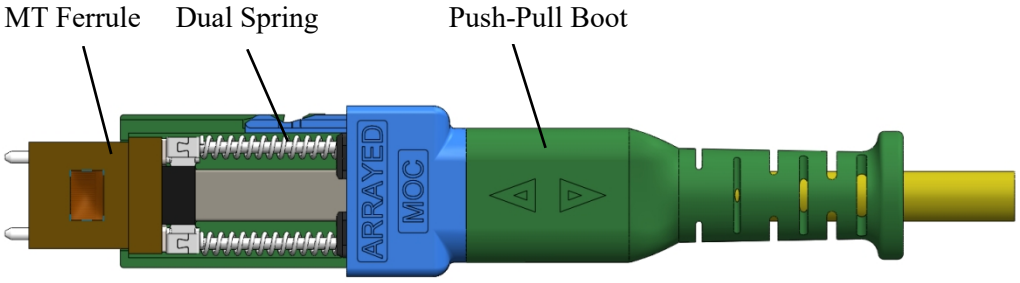


Figure 1: Structural diagram of the MOC connector

The MOC connector adapter incorporates a precision tunnel (Figure 2) that is only 0.1 mm larger than the MT ferrule on each side. This tunnel guides the two MT ferrules to achieve coarse alignment within the alignment tunnel, limiting the positional offset between the two MT ferrules to no more than 0.2 mm. Finally, the MT guide pins accurately enter the guide holes, achieving fine alignment between the ferrules. The adapter of a multi-fiber connector directly performing coarse alignment of MT ferrules is a world-first innovation.

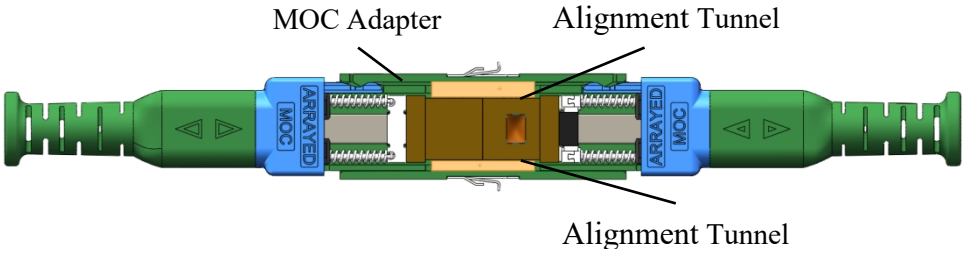
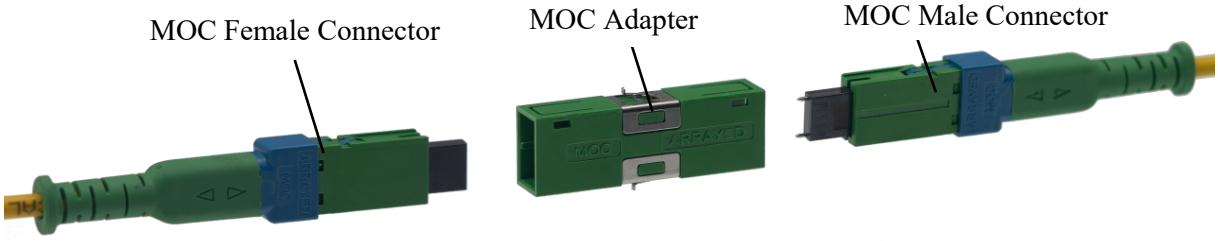


Figure 2: Schematic diagram of MOC connector mating

Product photo



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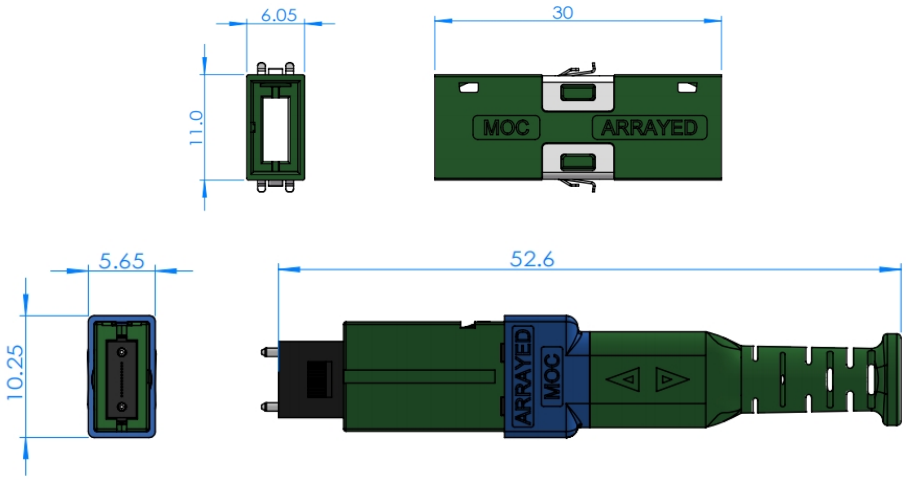
Product Advantages

- The MOC adapter incorporates a coarse-alignment tunnel, and the two-stage alignment mechanism greatly improves the optical performance of the connector.
- MOC connector mating features a buffered mating mechanism, significantly reducing fiber end-face impact and scratching.
- MOC is equipped with dual springs, providing more balanced spring force compared with a single-spring design.
- The total spring force inside the connector is 10 N for both 16-fiber and 24-fiber configurations. The commonly used 20 N spring force in the industry, which tends to cause serious reliability issues, has been eliminated.
- The MOC fiber optic connector is ultra-compact (VSFF). Its panel density is three times that of MPO connectors.
- The ultra-miniaturization of the MOC connector is not achieved by reducing the MT ferrule size. MOC uses standard-size MT ferrules, rather than failure-prone Mini MT ferrules, thereby ensuring reliability.
- Connector mating and demating are completed in one step via a push-pull boot, making operation simple and well suited for high-density panel connections.
- Standard 3.0 mm optical cables can be used. In contrast, several competing VSFF connectors reduce size at the expense of cable compatibility and do not support 3.0 mm cables.

Technical Index

MTC 2.0	SM		MM	
	Standard Loss	Low loss	Standard Loss	Low loss
Optical performance				
Insertion Loss（dB)	0.7	0.35	0.5	0.35
Return Loss(dB)	≥60		≥20	
Repeatability(dB)	≤ 0.1			
Mechanical Performance				
Durability	＞200			
Working temperature(℃）	-40~85℃			
Storage temperature(℃）	-40~85℃			

Product Size



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