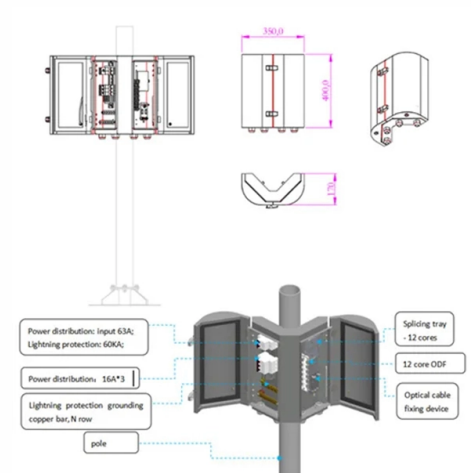


Principle of a 3-Port Optical Circulator



Article Overview

A 3-port optical circulator is a non-reciprocal device that routes light sequentially from Port 1 → Port 2 → Port 3, ensuring unidirectional signal flow using Faraday rotation and polarization control.

Structure

A typical 3-port optical circulator consists of:

- Input and output ports: Port 1 (input), Port 2 (intermediate output), and Port 3 (final output) for sequential light routing .
- Magneto-optic crystal: Usually Terbium Gallium Garnet (TGG), which induces Faraday rotation of the light's polarization under a magnetic field .
- Polarizing components: Polarizers or birefringent elements that control the polarization state of light, ensuring it follows the designated path .
- Fiber connections: Single-mode or polarization-maintaining fibers (e.g., SMF-28e or PM1550) guide light into and out of the circulator with minimal insertion loss . The device is compact and designed to minimize insertion loss (typically

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Three-port optical fiber circulator is a kind of non-anisotropic optical device, and light can only travel in one direction. If the signal is

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Optical circulator

Because of their high isolation of the input and reflected optical powers and their low insertion loss, optical

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Each optical circulator is a generalized isolator which has three ports or sometimes more. Where an isolator causes the

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Optical Circulators can be categorized into different types based on the number of ports and their operating principles.

Contact Us

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