Flex Circuit

Overview

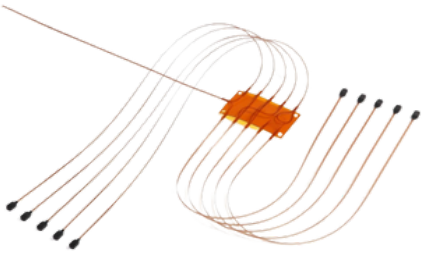
In modern communications systems, there is a growing demand for smaller, light, and faster solutions. This is evident in the widespread adoption of fiber optics in high-performance applications. At the core of these interconnect systems are high-density, durable, and versatile cable assemblies, which provide design engineers with the flexibility to optimize performance while minimizing space requirements.

Fiber Optic Flex Circuit Assemblies (FOFCA) address the growing need for efficient cable management aimed at optimizing airflow within communication systems. These assemblies offer an effective solution for routing fiber between boards, across shelves, or through confined and irregular spaces, ensuring both performance and spatial efficiency.

Flexibility is a key part in simplifying a system. Fiber can be configured in nearly any routing layout, whether point-to-point, shuffled, or in predefined patterns—to accommodate the specific needs of a given application.

FOFCA is manufactured based on custom design files, defined parameters, and application-specific requirements, allowing precise and space-efficient fiber routing within the system.

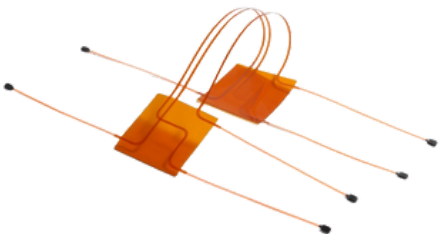
The use of polyimide materials and conformal coating adhesives ensures robust fiber protection, meeting the stringent durability requirements of harsh industrial environments.



The fiber circuit is mainly composed of four parts: adhesive substrate, optical fiber, coating glue and a termination connector. Substrate size & shape, fiber type, channel number, fiber leading-out form, connector type, fiber path, and optical cross relationship are some of the specs that can be customized upon demand.

Flex circuits can be terminated with a wide range of industry-standard connectors including MTP, MXC, LC, and SC. They also can be provided unterminated, allowing optical terminations to be applied as needed. Circuit dimensions range from just a few millimeters in width to large, complex sheets up to 1,240 square inches. Typically, 500mm x 500mm substrate can accommodate over 300 fibers.

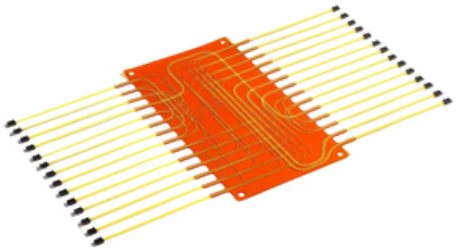
A single-layer optical plane can support anywhere from a few to several hundred or even thousands of channels. To further increase capacity, fiber channels can be multiplied through stacking, which is typically achieved using two primary stacking methods.



1. Physical Stacking: For most designs, keeping layer counts under five offers optimal flexibility. However, configurations with five or more stacked flex circuit layers can be implemented when required.
2. Integrated Stacking: In scenarios involving highly complex fiber routing, physical stacking may not be practical. Integrated stacking treats all layers as a unified structure, allowing fiber outputs from each layer to be reorganized for advanced cross-routing and denser interconnections.

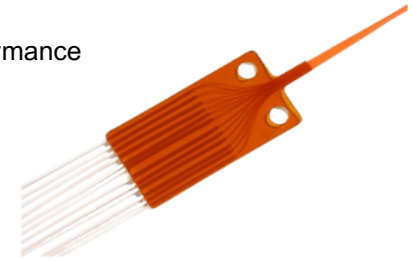
FIBERTRONICS

Flex Circuit



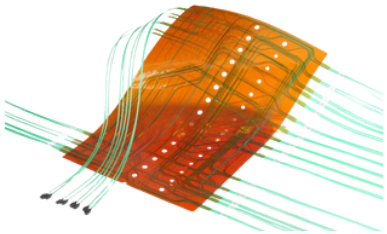
Key Features

- Customizable:
  - Bypass hole and positioning hole
  - Substrate size, shape and packaging
  - Routing schemes
- Delivers efficient and manageable solutions to high-fiber count systems
- Supports both bulk and single-fiber terminations
- Offers direct termination or fusion splicing options
- Minimizes additional insertion loss
- Optical fibers are routed to a substrate and locked into place with conformal coating
- Long ribbonized leads, to eliminate the need for splicing, and a faster setup
- Proper bend radius design ensures long-term reliability, durability and maintain optical performance



Typical Applications

- Aerospace
- Telecommunications (Hubs, Servers Routers, Switches)
- Optical Cross-Connect (OXC)
- Card to Card
- Intra-Rack Fiber Management
- High Density Fiber Management
- Flexible Optical Harness, Breakouts and Shuffles
- CPO Optoelectronic Integrated Package
- Backplane Interconnection Assemblies



Technical Specifications

Terminations Supported	MTP, MPO, MT ferrules, LC, SC, MXC, MDC, etc.
Position Accuracy On Substrate	±0.01mm
Fiber Modes Supported	Singlemode, Multimode, and Hybrid versions
Fiber Diameter	250µm and Special Fibers
Material	Optical Fiber Protection: Conformal Coating Substrate: Polyimide
Operating Temperature	-40°C to +85°C
Maximum Size	800 mm x 1000 mm
Substrate Size Tolerance	± 3mm 300 fibers (500mm x 500mm substrate)
Optical Performance	<0.1dB loss (excluding connector)