

Fiber Flex Optical Circuits

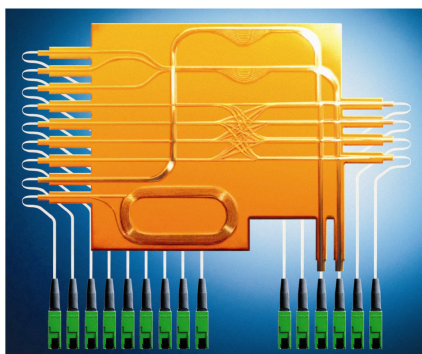
Applications

The Cinch Connectivity Solutions, Stratos Brand Fiber Flex Optical Circuits provide superior solution for fiber routing and fiber management for PCB card level or backplane applications. Typical applications include optical harnesses, breakout/fanout cables, shuffle circuits, optical delay lines, matched (low skew) lines, optical cross connects, optical backplane, and optical mezzanine circuits.

The Cinch Connectivity Solutions Fiber Flex is created from custom design files and parameters to route the fiber network in a compact and efficient manner. The use of rugged materials such as Kapton, Fluorosilicon, PEEK, FEP, and adhesives provide reliable protection to the optical fiber, satisfying the rugged demands of Mil-Aero and rugged Industrial applications.

Supported fiber types include singlemode, multimode, or specialty fiber such as Rad-Hard or Bend-Insensitive. Circuit designs may be as simple as a few fibers or as complex as hundreds of fiber nets. Circuit sizes can run from a few millimeter wide routed ribbon fiber to a large complex 400 sq inch flat circuit. The routed circuit can be easily extended by the addition of an optical harness or fan-out assemblies.

Fiber Flex circuits are normally offered as a terminated fabric, where all optical terminations are added, net-list checks are performed, optical insertion loss and return loss are measured and recorded, and end face geometries are verified. Flex Circuits can also be offered unterminated where the customer adds the optical termination at a later date.



Features

- Custom routed flexible fiber circuit
- Kaptop, Fluorosilicon, PEEK, or FEP substrate
- Superior fiber management
- Durable and Reliable for Rugged Applications
- Complex fiber circuit routes in minimal space
- Controlled routing lengths, low skew designs
- Controlled bend radius, minimizes bend loss
- Singlemode, Multimode, or Specialty fiber
- Supports all industry standard termini
- Reduced installation times and errors

Quick Quote Information Needed

Requirements	Examples
Number and type of fibers	SM/MM, etc.
Number and type of termini	MT, 29504, etc.
Dimensions and tolerances	L x W, +/- Y
General layout guidelines	Shape, keep-outs

Performance

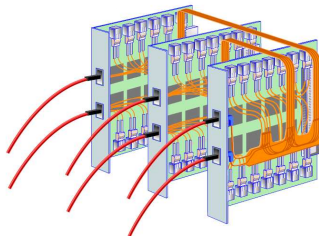
Parameter	MIN	Typical	MAX	Unit
Storage Temperature	-55		+125	°C
Operating Temperature	-40		+100	°C
Optical Fiber Nominal OD		250		µm
Fiber to Fiber spacing	250			µm
Circuit Thickness	0.6			µm
Circuit Dimensions – Note 1			20x20 (Note 1)	inches
Matched Length Tolerance		<+/-4		mm
Bend Radii – Note 2		0.5		inch

Note 1 – Circuit size can be extended with optical harness
 Note 2 – Bend Radii is fiber type dependent, 0.5 inch typical

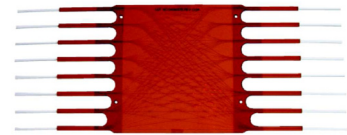
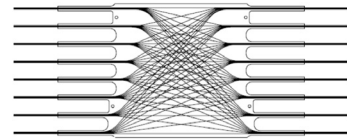
Fiber Backplane

Optical Fiber Flex circuitry is designed to optimize complex fiber optic layouts with extremely high fiber count, providing system designers with real solutions to growing fiber management problems. Developed in the 1990's by Stratos Lightwave (now a part of Bel Fuse Cinch Connectivity Solutions), and improved upon over the last 20 years, these compact circuits have all channels, ports, and fiber routings preconfigured to reduce installation time and simplify system architecture. With few design rule limits to size, shape, or routing complexity, this unique product can greatly improve overall system performance and reliability.

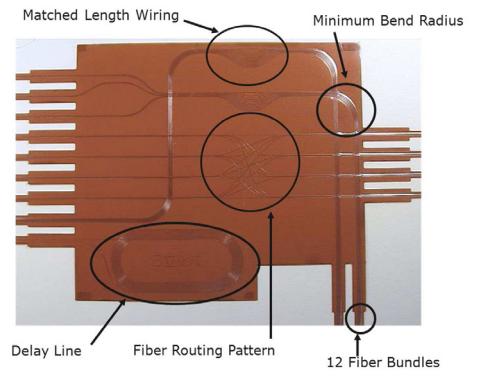
Cinch Connectivity Solutions embedded technology allows continuous lengths of optical fiber to be bonded to a variety of substrate materials in precise, predetermined path locations. Fiber paths can intersect such that fibers cross over one another in the manufacturing process without becoming damaged or incurring significant microbending losses.



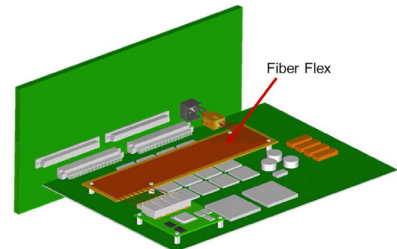
Shuffle Circuit Example



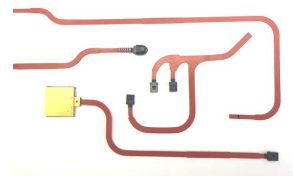
Fiber Routing Capabilities



Fiber Mezzanine



Routed Ribbon



Optical Fiber Flex Design Software

Optical Fiber Flex circuitry is made possible with Cinch Connectivity Solutions CAD software design tool suite. The CAD design tools allows the designer to create nearly any fiber routing scheme. True 3-dimensional fiber management capabilities help manage fiber micro-bends and macro-bends, playing an important role in the long term reliability of the fiber and reducing attenuation of the signal.

CAD Software Functions:

- Design complete optical interconnection layouts
- Interactive point-to-point interconnect
- Precisely match fiber lengths
- Design layouts in three dimensions
- Import and export commonly used DXF files
- Apply appropriate bend radii design rules to the fiber
- Easy geometry conversion
- Access databases directly
- Optimize fiber routes and layouts

The CAD software feeds into one of several CNC controlled Fiber Beds, where precise placement and routing of the fiber is performed onto the substrate material. The machine process flow of CAD design output driving the CNC Fiber Bed provides constancy and repeatability for additional copies of the fiber circuit.

Custom Route Example

