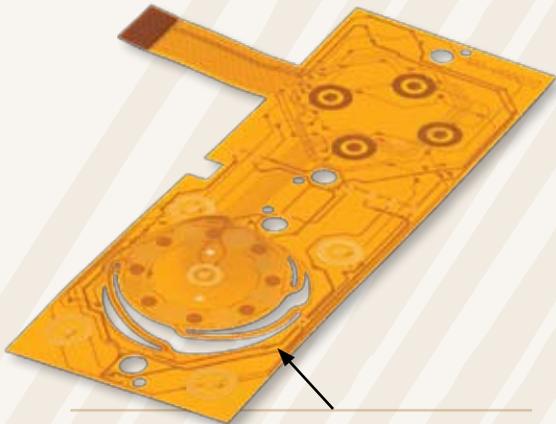


# FLEXIBLE CIRCUIT<sup>®</sup>

## Technologies



Laser cutting can eliminate the time and cost of tooling during prototyping. It can also be an effective way to cut out unique shapes within a flex circuit.

Rigid flex circuits combine rigid FR-4 areas for dense component population interconnected with flexible polyimide areas which can be bent to accommodate overall packaging needs.



Shielded flex circuits reduce noise and control impedance of signal lines. Shielding can be solid, patterned or cross hatched and can be on one or both sides.

**WE GO WHERE OTHERS WILL NOT™**

**ISO 9001:2008, ISO 14001:2004, ISO 13485, TS 16949,  
ROHS COMPLIANT, ITAR REGISTERED, UL REGISTERED,  
FDA REGISTERED, IPC MEMBER, BBB MEMBER**

# FLEXIBLE CIRCUIT Technologies

## Flexible Circuit Technologies

knows how difficult it can be to find a supplier that is experienced in a wide variety of industries and flexible enough to take on any technical challenge. What makes FCT different? On the front end, our engineers have a wealth of experience in unique applications and a desire to solve problems that others will not. We have domestic and international production capabilities to bring design to reality, and if necessary we can add a dedicated manufacturing line to meet your unique product needs. Finally, with our inventory stocking program, your products can be built in quantities required to effectively meet your business objectives, while being delivered in quantities and time frames desired by your production facility. Like our motto says "We Go Where Others Will Not!"

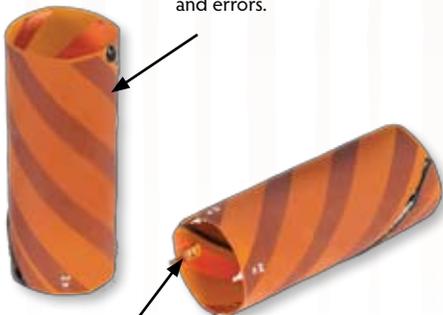
Single, double, multilayer flex circuits, as well as rigid flex circuits, can be designed with dozens of different conductors, adhesives, insulation layers, finishes, connectors and more. The combinations are nearly endless and are limited only by the designer's imagination. Please ask for our design guide or visit our website to see more technical information and ideas.

[www.FlexibleCircuit.com](http://www.FlexibleCircuit.com)

Sales@FlexibleCircuit.com

Phone: 763-545-3333 | Fax: 763-545-4444

Pre-formed circuits reduce subsequent assembly time and errors.

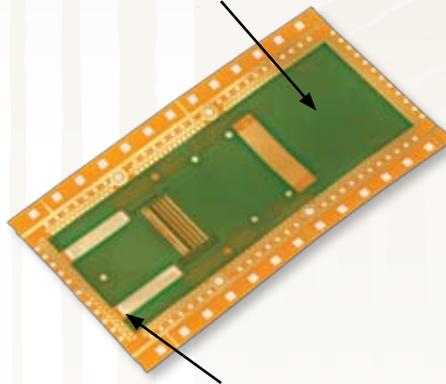


Crimp pins are mechanically attached to a circuit to allow for soldered connections.

Flexible Heaters are thin bendable elements that can be shaped to fit your unique heating equipment needs

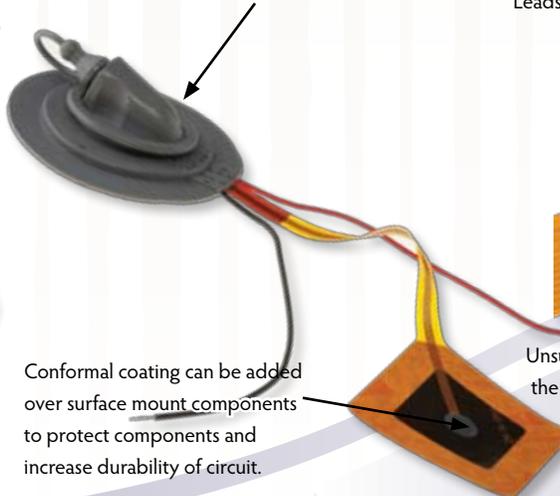


Fine lines and spaces down to 1 mil each.



Windowed Leads are unsupported conductors running across a window and allow for tight pitch for mass terminations.

Over molding embeds electronics on the circuit and provides a more finished appearance.



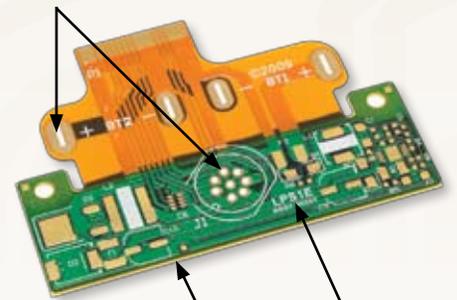
Conformal coating can be added over surface mount components to protect components and increase durability of circuit.

Dual access is accomplished on a single sided flex by laser skiving openings on the bottom side of the flex.



ZIF (Zero Insertion Force) connection allows a flex circuit to be inserted into a circuit board mounted connector with a mechanical actuator that locks the flex in place. A stiffener is applied underneath the exposed traces for additional support.

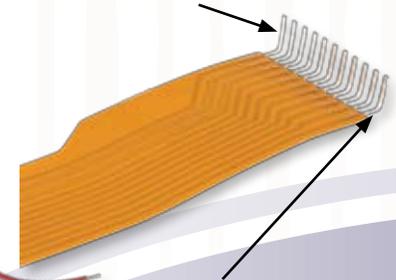
Plated through holes connect circuit layers and are used for through hole component assembly.



Stiffener applied to rigidize the area of component assembly.

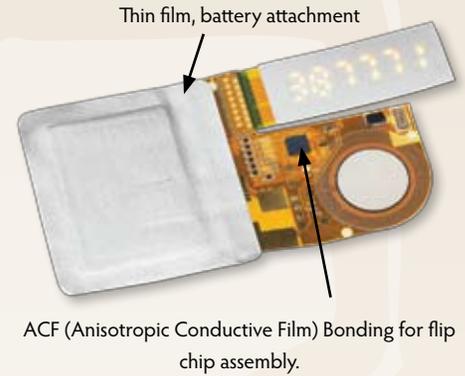
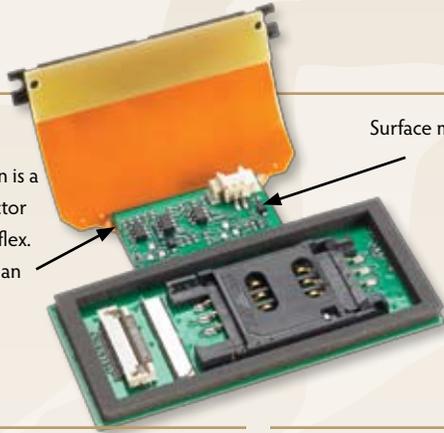
Silkscreen nomenclature can be useful to add identifying markings to circuits.

Leads can be pre-formed in different planes or forked to meet your assembly needs.

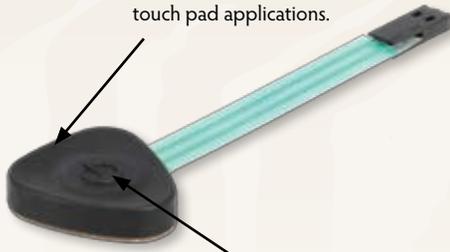


Unsupported leads are conductors extending from the edge of a flex circuit allowing for direct solder connection to mate.

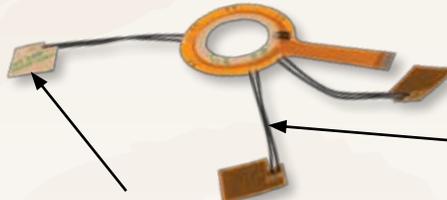
Hot bar solder connection is a way to eliminate a connector between hardboard and flex. This connection provides an efficient, durable and less expensive alternative to a standard connector set.



Silicone rubber keypads can be attached to flex for touch pad applications.



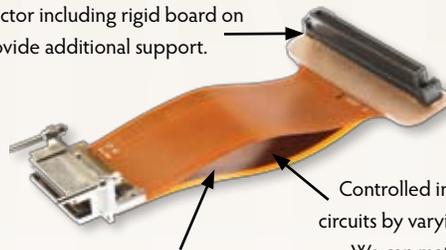
Metal domes attached to flex for use in actuation devices.



Traditional wire can be used to attach a flex circuit as a more economical design that still meets the needs of the customer's subassembly.

PSAs (pressure sensitive adhesive) with a release liner are used in applications where a portion(s) of the circuit needs to be secured to a specific location within the final product. During assembly, the release liner is peeled away and the exposed adhesive allows the assembler to process the circuit into place and keep it there.

Through hole connector including rigid board on back side to provide additional support.

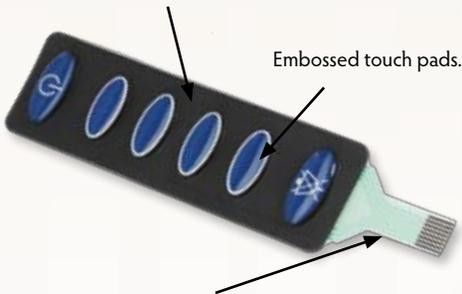


Controlled impedance can be designed into flex circuits by varying dielectric and conductor thickness.

We can match the impedance throughout the flex to minimize electrical reflections. This ensures an error free transition between the trace and interconnections.

Unbonded flex circuits include separate conductor layers and coverlays in designated areas that provide greater flexibility than fully bonded multilayer circuits.

Graphic overlays provide direct human interface through touch activation of the circuitry and can include embedded components such as LEDs.



Embossed touch pads.

Membrane switch using printed conductive silver ink.

Wire harness conversion to flex reduces wiring errors from hand made connections and decreases assembly time.



### WHY USE FLEX? AREN'T THEY ALWAYS THE MOST EXPENSIVE OPTION?

In a word, NO. When you consider the total cost of getting the job done, flex circuits many times are the most reliable and best choice. Here's are just a few reasons why:

BENEFITS OF FLEX	HOW?
<b>Decrease in weight &amp; size</b>	Flex circuits contain the thinnest dielectric substrates available. Thinner for a more streamlined design, eliminating the need for bulky rigid boards.
<b>Reduce wiring errors</b>	Eliminate harnesses and hand-made connections.
<b>Decrease in assembly time &amp; cost</b>	Conductors are photo-defined. More choices for automating assembly of all components. Eliminate routing, wrapping and soldering wires.
<b>Flexible design freedom</b>	Virtually unlimited. Flex circuits allow a third dimension to your work because they can interconnect between two or more planes during execution. They solve space and weight problems unmatched by rigid boards. Flex circuits can be manipulated many times during installation and execution without electronic failure.
<b>High density applications</b>	Denser populations let you add features or shrink the package to take up a fraction of the space other interconnects require.
<b>Increase in reliability</b>	Most circuit failures occur at an interconnection point. Flex circuits can reduce the number of interconnections to increase reliability.
<b>Lower overall costs</b>	Factor in all your soft and hard costs. Flex will surprise you!

# Choosing the best materials for your project using the best global sources.

Let us globally source the best materials for you at the best price. Here's a sampling of our material choices:

- Conductors: copper, cupro-nickel, inconel, constantan, silver ink, carbon, and aluminum
- Adhesives: epoxy, acrylic, pre-preg, PSA, and adhesive-less
- Insulators: polyimide, polyester, PEN, PET, solder mask, and PIC
- Finishes: ENIG, ENEPIG, hard nickel/gold, immersion tin; organic (OSP), tin plate, and HASL

Remember, as with our design services, **"We Go Where Others Will Not"** with our materials as well. Refer to our Design Guide or our website for more technical information and options for all materials.

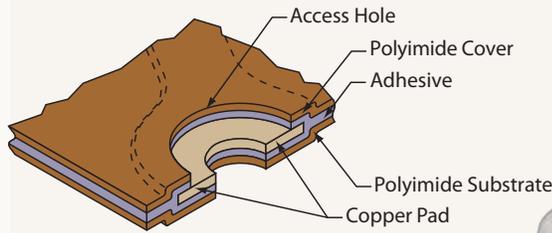
## Services that also demonstrate we will go where others will not!

It's not just our design and manufacturing capacity that makes us different; our technical, engineering, procurement and customer services give us a competitive advantage.

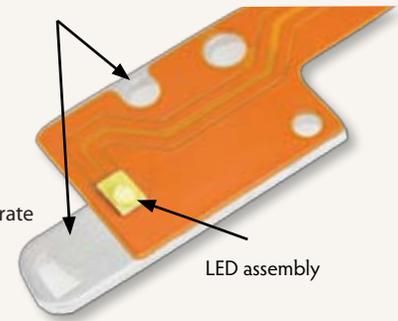
- Engineering and design support—Applications and design engineering staff with years of experience in flexible circuitry.
- Domestic and international production capabilities—Three manufacturing facilities in Asia and USA.
- Value Added Assembly—Reduce your vendor count, production delays and quality issues by having us do your sourcing, assembly and testing. From a single component to complex box build, we can handle your needs.
- Inventory Stocking—Pull and push inventory to meet your needs. Order in high volume but let us manage your inventories with JIT deliveries.
- Prototypes, high or low volume—Many manufacturers have minimum custom orders. We don't. Order one to a million.

ISO 9001:2008, ISO 14001:2004, ISO 13485, TS 16949, RoHS Compliant, ITAR Registered, UL Registered, FDA Registered, IPC Member, BBB Member

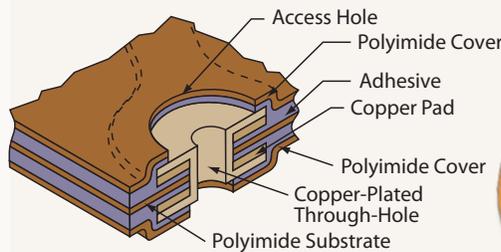
### SINGLE SIDED FLEX



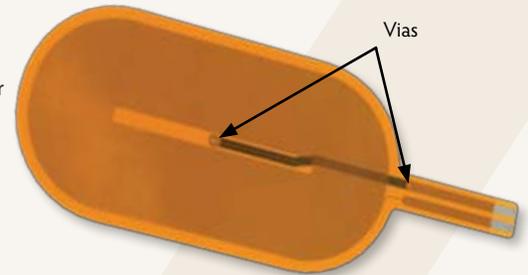
Heat sinks can be laminated to flex circuits to dissipate heat away from sensitive components such as LEDs.



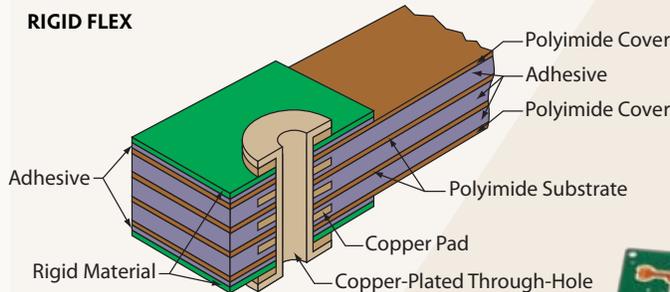
### DOUBLE SIDED FLEX



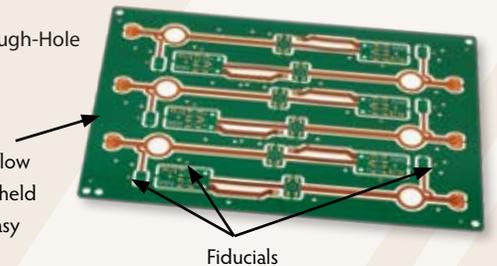
Flexible coils are used in applications such as antennas. The etched coils are highly repeatable and well protected in the dielectric materials.



### RIGID FLEX



Circuits can be provided in panel form to allow for subsequent SMT assembly. Circuits are held in panel with breakout tabs that allow for easy depanelization after assembly.



## FLEXIBLE CIRCUIT TECHNOLOGIES | [www.FlexibleCircuit.com](http://www.FlexibleCircuit.com)

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