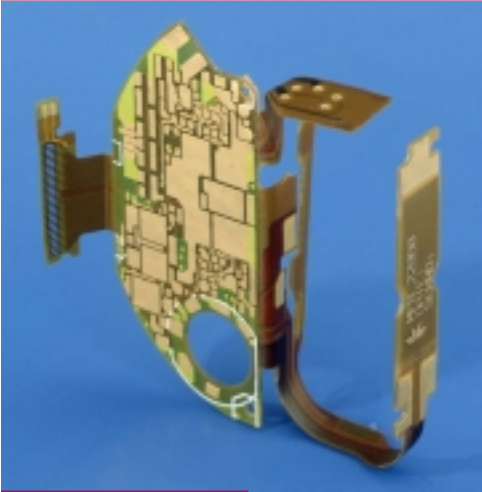




TELEDYNE ELECTRONIC TECHNOLOGIES

Printed Circuit Technology
A Teledyne Technologies Company



High Density Rigid Flex for Medical Applications

Laminate based multi-chip modules

In today's market of smaller, lighter, and denser three dimensional electronic packaging, Teledyne Electronic Technologies has developed a low cost substrate that utilizes advanced MCM-L technology specifically designed to meet the needs of high reliability applications. This technology offers the medical industry a low cost answer to interconnect needs for both implantable and external medical devices. Based on Teledyne's REGAL Flex[®] technology, multi-chip packaging is accomplished on a laminate substrate that has the ability to be folded into tightly constrained form factors reducing the need for connectors and other interconnect hardware. The elimination of solder interconnects reduces assembly time and cost with a resulting increase to the product's overall reliability. Design engineers now have the freedom to decrease the overall size and weight of the interconnect package using this unique technology.

The materials and processes used to produce these multi-layer rigid flex products are similar to those currently used to manufacture circuit boards for military and aerospace applications. Teledyne is able to offer the same high reliability in a smaller form factor by taking advantage of state-of-the-art techniques such as high definition imaging and laser drilling to increase circuit density without compromising reliability. The core of the construction is Teledyne's patented REGAL Flex[®] construction that offers the highest thermal and dimensional stability of any rigid flex substrate. This coupled with advanced assembly techniques such as flip chip and chip-on-board offers the end user significant increases in interconnect density.

Three - dimensional electronic packaging

Teledyne is proud to offer design, fabrication and assembly services to provide the shortest time to market. Full testing to industry specifications is available to assure product reliability.

TYPICAL PRODUCT HIGHLIGHTS

- Regal Flex multi-layer rigid flex substrate
 - Ensures dimensional stability
- Line width and spacing 0.004" typical
 - 0.003" available
- Blind and buried vias
 - 0.008" typical
 - 0.006" available
- Laser drilled micro-vias
 - 0.003" holes with 0.009" pad for maximum circuit density
- Integrated flex I/O's
- Thin core substrate materials
 - Dielectric materials as thin as 0.001"
 - Copper thickness down to 5 micron
- Direct attach of bare die
 - 0.006" pitch wire bond
 - Soft gold metal finish
- SMT compatible including low profile and high I/O packages such as TQFP, TSOP, BGA
- Reduced need for connectors
 - Increases reliability
 - Decreases weight and volume

110 Lowell Road
Hudson, NH 03051
Tel: 603 889 6191
Fax: 603 882 4457
email: pctsales@teledyne.com



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