Rigid Flex Circuits: A Technological Overview

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Summary: Rigid flex circuits are considered to be a relatively new type of electronic interconnection option but they in fact have a fairly long history of use solving a wide variety of challenging interconnection problem. This presentation will provide a concise but comprehensive overview of a technology that has seen ever increasing use since its inception. Included will be examples of structures and applications, key design concerns and speculative examples of what might yet be to come.

Keywords: Rigid flex circuits, electronic interconnections,

Description of the Keynote Presentation

Rigid flex circuits have were first practically demonstrated and used in the 1960s and they have seen increasing use in electronic products ever since. It is arguable that many of the electronic products we presently rely on would be impossible to build without using flexible and rigid flex circuits. The benefits of these increasingly important electronic interconnection structures are many. First and foremost, they are a true three dimensional solution allowing electronic components and functional/operation elements (i.e. switches, displays, connectors and the like) to be placed in optimal locations within the product assuring ease of use by the consumer. In the presentation, other advantages will be cited.

The presentation will also discuss briefly some of the material options and describe some of the more common constructions and equally important discuss some of the important design considerations that must be accounted for in order to assure first pass success in getting a rigid flex design through the manufacturing process.

Fig. 1: Examples of various rigid, flex and rigid flex circuits illustrate the variety of choice

Main Topics Covered in the Keynote Presentation

With limited time for the keynote, the subject of rigid flex circuits cannot be discussed in depth, however, there are some key points that will be discussed to provide participants as good basic understanding of the technology thought a brief discussion of them

When and where to use rigid flex circuits,

Rigid flex circuits are a great choice for interconnections but often flexible circuits and simple rigid circuits can often do the job better

What one needs to know about materials used in manufacture of rigid flex circuits

Materials used in rigid flex constructions cross boundaries and knowing where and how they intersect and interconnect is key to success.

What are the top key design concerns for rigid flex circuits?

As one of the most complex of electronic interconnection structures, rigid flex circuits require extreme care in design

What are the most common types of rigid flex structures?

Rigid flex circuits are the most highly engineered form of electronic interconnection, however, there are but a few basic structures and techniques used in their construction as will be shown.

Where might be rigid flex circuit technology be headed next?

Rigid flex technology has been continuing to evolve since its inception as clever designers press the envelope to realize their dreams and make them material. Examples of leading edge rigid flex designs will be shown along with some speculative structures on the drawing board that might see future application.

Reference material available

The presenter of this keynote is author of one of the most world's most widely used books on flex circuits. It is titled: *Flexible Circuit Technology*, and is now in its 4th edition. It can be downloaded for free by those with interest in learning more at:

www.flexiblecircuittechnology.com