

Technology Today

Technology.Today@worldnet.att.net

Alan Pierce

Microflex Technology

ARE you old enough to remember when a chip was something to snack on? Do you remember when a transistor looked like a tiny top hat with wires? Today when most people refer to chips they are talking about small electronic devices that contain millions of transistors. These chips arc found in just about every product that uses batteries or runs on electric current. Most manufacturers have found a way to replace the massive electric wired circuitry of the past with these complex IC chips that can be made quickly and inexpensively.

Computer chips might be the heart of many wonders of this electronic age, but they are still assembled on printed circuit boards that haven't changed much since the 1950s. However, the recent introduction of the newest 3M Microflex circuits should breathe new life into the design process that determines the shape of new electronic devices (Fig. 1).

Microflex circuit boards look like flexible ribbons (Fig. 2). They are, however, the functional equivalent of today's laminated paper, or resin binder fiberglass printed circuit boards. These super-flexible circuit boards can help manufacturers create smaller, curvy products because they can be curved into free-flowing shapes, or even rolled up like a ribbon.

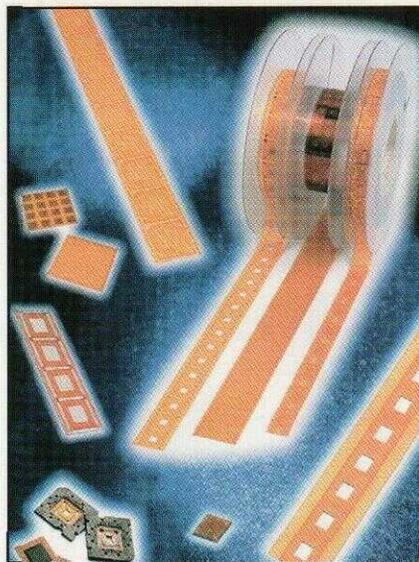


Fig. 2 Image courtesy 3M Innovation

By using these Microflex circuit boards manufacturers can package their semiconductors and IC chips into much smaller and lighter working products. 3M is ready to reduce the fine pitch of their Microflex product from 50 microns (um) to 25 um lines and spaces. A micron (um) is one 1,000th of a millimeter. You can appreciate this circuitry size by equating 25 microns with half the thickness of a human hair.

Without getting technical, this magnitude of reduction will have a major effect upon the size of electronic circuitry. For example, it will decrease wire traces to 1/5 of their current length. This closer spacing of the circuit traces will also improve shielding of the circuitry, which is accomplished through the metal stiffener that is bonded to the thin metal tape with a high temperature adhesive. This adhesive also allows for very high temperature (200°C) wire bonding. In the field as part of a product, this metal stiffener quickly spreads heat in the circuit over the Microflex's entire surface,

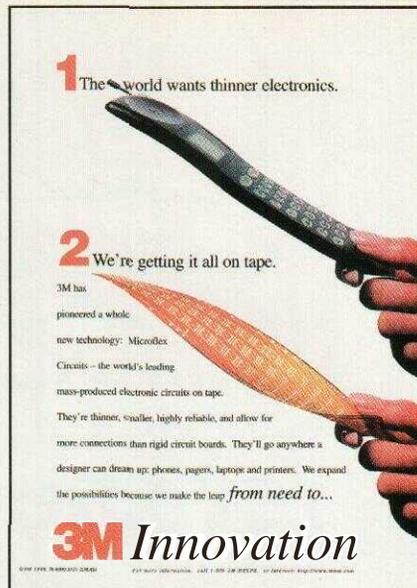


Fig. 1 Image courtesy 3M Innovation

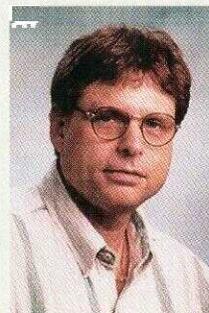
preventing hotspots that can degrade circuit efficiency.

The latest 3M Microflex product is called a Tape Ball Grid Array (TBGA) and it is currently being used by electronics manufacturers in their ongoing research to develop new products. Since the battle cry of modern manufacturing for the 21st century is "We can make it smaller, stronger, lighter, better, and cheaper," you can expect to find this technology in many of the new products that you buy in the coming years.

Recalling the Facts

1. Why are circuit boards used in electronic devices?
2. In what way could the use of the newest Microflex connectors change the design appearance of electronic products?
3. How many microns are equivalent to the width of a human hair?

Alan J. Pierce is a professor, Department of Technology, Elizabeth City State University, Elizabeth City, NC 27909.



Tech Directions Online

In Review:
Aviation History

Extra Tech Classroom Projects
Bulletin Board • And More!

TEACH ELECTRONICS

EASILY AND EFFECTIVELY

KITS • COURSES • LABS



MODULES • COMPONENTS • VIDEOS

• FREE TECH SUPPORT FOR EDUCATORS

LOW COST KITS!

TEACHER SAMPLES available!

FREE CATALOG
1-800-422-1100

"Thousands of teachers across the U.S. are currently using these materials. If you need ideas for your program, call me.— With over 25 years in electronics education, I'll be happy to share my experience with you."

— Gary Gibson, President

Gibson Tech Ed, Inc.
TECHNOLOGY YOU CAN BUILD ON

1-800-422-1100

(email: garxg@itsnet.com — (fax) 1-800-470-1606

www.GibsonTechEd.com

Circle No. 13