NASA TECH BRIEF
Goddard Space Flight Center

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Welded Printed Circuit (PC) Stick

Electrical connections in semiconductor IC packages are frequently produced by the comb technique. The comb is an etched conductive material. On the average, there are 16 to 20 such combs per module. Each comb is different and requires separate artwork before fabrication. After the artwork is finished, the combs are photographed, etched, and later stacked to form multilayer interconnections. There are several problems that exist when one decides to use this technique, but by far the largest problem is the capacitance problem. By stacking the comb layers you also build in capacitors. In addition to this problem it is all but impossible to make any changes or repairs and it is very difficult to electrically "trouble shoot" any problem. There are eight major steps in this method, and it takes six hours to design and fabricate per 14-lead flat pack and seven hours per 22-lead flat pack. Each flat pack fabricated with this method averages 3 g in weight.

A new method called the PC (printed-circuit) stick module has reduced the comb technique to six steps, cutting process time by approximately 50%.

This new technique uses a ribbon wire which is welded from a PC board to nailhead pins. Its major steps are as follows:

1. All artwork is photographed;
2. The fiberglass support board is etched and drilled;
3. The nailhead pins are inserted;
4. The Mylar insulator film is punched;
5. The point-to-point connectors, from the PC board to the pins, are welded; and
6. All other components are welded.

This method is designed to incorporate all types of components into one assembly. In addition, it reduces the design and fabrication time for the 14-lead flat pack to less than four hours and for the 22-lead flat pack to four hours. The average weight of each flat pack is also reduced to 2 g. Finally, fabrication costs are cut by more than 50%.

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
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Greenbelt, Maryland 20771
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Patent status:

NASA has decided not to apply for a patent.

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