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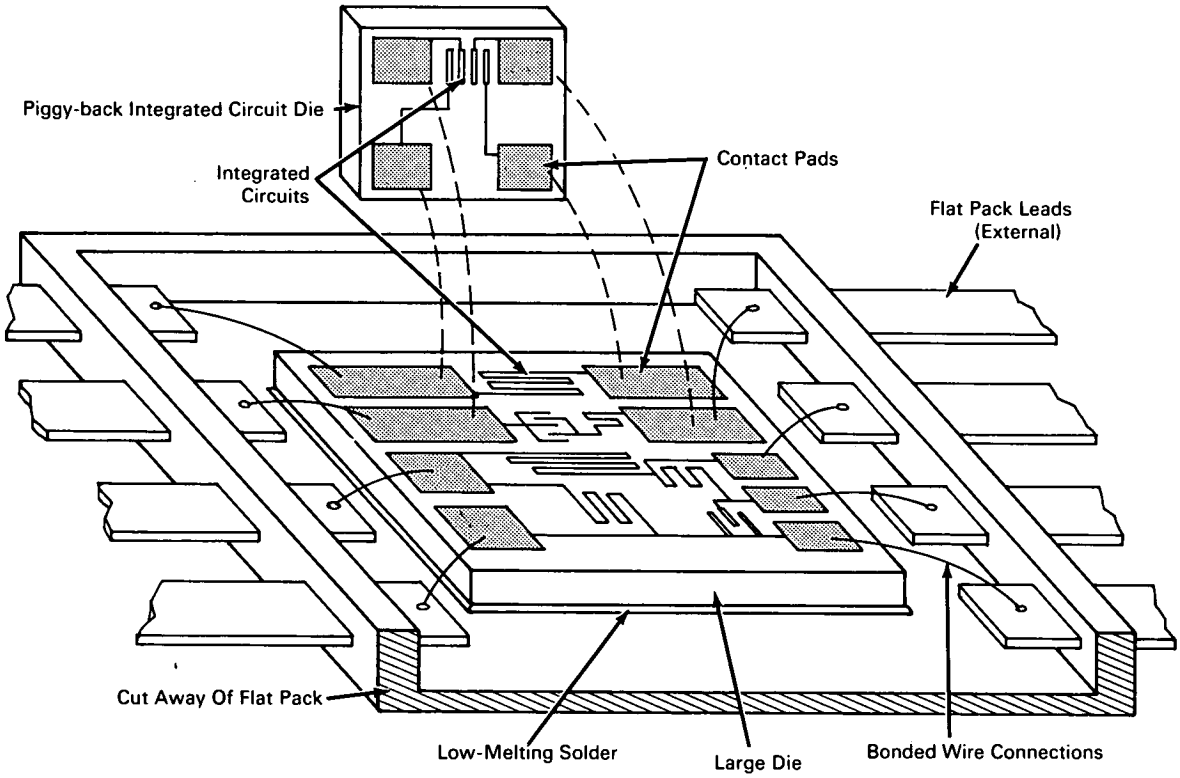
# NASA TECH BRIEF



## Piggy-Back Mounting Would Increase Microcircuit Packaging Density




The packaging density of integrated circuits would be increased by face-mounting an integrated circuit die on a larger integrated circuit die, rather than separately on an insulating substrate as in conventional practice. This piggy-back method of packaging would also increase design flexibility, as chips of different types can be combined to form an integrated circuit which is impractical to fabricate in a single die by standard methods. The piggy-back packaging additionally would eliminate interconnection leads between the die and associated inductances, and thus increase the attainable frequency response of the circuit.

The illustration shows the piggy-back die, rotated out of position, with a contact arrangment corresponding to the contact pattern on the larger die. The integrated circuits (protected by glass coatings) on each die will be separated only by the contact pad thickness when the piggy-back die is attached to the larger die. Any one of several methods, involving

(continued overleaf)

heat, pressure, mechanical scrubbing, or a low-melting solder, can be used to attach the smaller die. The larger die is shown mounted in a flat pack to which it is attached by means of a low-melting solder.

**Note:**

This development is in the conceptual stage only, and as of the date of publication of this Tech Brief, neither a model nor prototype has been constructed.

**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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