

# Methods of Manufacturing Microdevices in Laminates, Lead Frames, Packages, and Printed Circuit Boards

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## BACKGROUND

Microelectrical-mechanical systems (MEMS) are miniature mechanical devices intended to perform non-electronic functions such as sensing or actuation. These devices are typically built from silicon using lithographic techniques borrowed from the semiconductor industry. This manufacturing technique is expensive and limited. Furthermore, almost all micromachined devices must eventually be placed in a protective housing so that electrical connections can be made to the devices, and to protect the devices. This is troublesome for MEMS devices because they are fragile and so extreme care must be taken to move them from their fabricated substrates (e.g., wafers) to micro-electronic packages. It is well known that 60%-80% of the final cost for a MEMS device is from the costs associated with packaging.

## TECHNOLOGY DESCRIPTION

University researchers have developed a method of manufacturing that enables micromachined devices to be built in substrates and base materials typically used for packaging microelectronic circuits, in package materials often used for packaging microelectronic devices, as well as in printed circuit boards, both rigid and flexible. The micromachined devices can be fabricated using methods that are similar to or identical to methods already in use by manufacturers and assemblers of packaging substrates, lead frames, packages and printed circuit boards, thus enabling easy integration into existing manufacturing processes, and enabling these processes to be used to manufacture small devices.

## APPLICATIONS

Micromachining, especially where such micromachining is expected to be packaged with electrical components.

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,877,074	11/04/2014	2007-553

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## OTHER INFORMATION

### CATEGORIZED AS

- » **Medical**
  - » Devices
- » **Nanotechnology**
  - » Electronics
  - » Tools and Devices
- » **Sensors & Instrumentation**
  - » Biosensors
  - » Other

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2007-553-0

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