Micro-electromagnetically Actuated Latched Switches

Tech ID: 23115 / UC Case 2011-664-0

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BRIEF DESCRIPTION

University researchers have developed a miniature relay switch, with an overall volume of less than 100 mm3 that can handle up to 40 W of DC or 60 Hz line power. This invention also relates to methods of manufacturing these relay devices directly within or on any of the following using standard electronic manufacturing techniques: lead frames, substrates, microelectronic packages, printed circuit boards, flex circuits, and rigid-flex materials.

SUGGESTED USES

This invention has utility in the area of industrial controls, automotive, appliances, power systems (e.g. solar cells), and lighting (especially solid state lighting).

ADVANTAGES

This invention uses printed circuit board and laminates to build MEMS relay devices, which is ideally suitable to the needs of high power applications, since it allows the creation of rugged, highly conductive contacts, and allows relatively easy integration of alternative technologies such as magnetic components for electro-magnetic actuation. These small-sized devices employ an electromagnetic actuation component that directs electric current through another contact in the “on” state, or provides an open circuit in the “off” state. The device requires low voltage to actuate, and require zero power to maintain either the “on” or “off” state (latching).

INVENTORS

- Bachman, Mark G.
- Li, Guann Pyng
- Wang, Minfeng
- Zhang, Yang

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,580,604	03/03/2020	2011-664
United States Of America	Issued Patent	9,601,280	03/21/2017	2011-664
United States Of America	Issued Patent	8,877,074	11/04/2014	2007-553
United States Of America	Issued Patent	8,824,707	09/02/2014	2007-321
United States Of America	Issued Patent	8,074,346	12/13/2011	2003-361
United States Of America	Issued Patent	7,884,689	02/08/2011	2002-369
United States Of America	Issued Patent	7,541,898	06/02/2009	2003-361
United States Of America	Issued Patent	7,265,647	09/04/2007	2003-361

OTHER INFORMATION

KEYWORDS

Printed circuit boards, Switches, MEMS

CATEGORIZED AS

- **Energy**
  - Lighting
  - Solar
- **Semiconductors**

» Design and Fabrication

RELATED CASES

2011-664-0, 2007-553-0, 2007-321-0, 2003-361-0, 2002-369-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Manumeter for Monitoring and Assessing Upper Extremity Rehabilitation
- Magnetic Recovery Method Of Magnetically Responsive High-Aspect Ratio Photoresist Microstructures
- Web-Enabled Devices
- Use Of Micro-Structured Plate For Controlling Capacitance Of Mechanical Capacitor Switches
- MEMS Sensor Enabled RFID System And Method
- Personal Energy Footprint Management System
- Magnetically Actuated Micro-Electro-Mechanical Capacitor Switches In Laminate
- Hearing device that amplifies sound using a tympanostomy tube

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