

Title (en)
MICRO-ELECTROMECHANICAL RELAYS

Title (de)
MIKRO-ELEKTROMECHANISCHES RELAIS

Title (fr)
RELAIS MICRO-ELECTROMECHANIQUES

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Application
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Abstract (en)
[origin: WO9834269A1] A micro-electromechanical relay ("micro-relay") designed to both miniaturize and improve upon present day electromechanical relays. The micromachining fabrication process used to make the inventive micro-relay is based upon technology originally used by integrated circuit (IC) manufacturers. In simplest terms, the preferred inventive process consists of three steps, all performed using micromachining techniques. First, a layer of magnetic material is laid down on a substrate and patterned into a desired shape. Next, an electromagnetic coil (3) is created adjacent this material. Finally, a second layer of very efficient magnetic material is laid down adjacent the first two layers, forming a magnetic circuit, and having a portion fashioned into a deflectable structure, such as a cantilever beam (4A). The deflectable structure (4A, 4B) has at least a portion that is suspended over or adjacent to at least one electrical contact. In operation, current passes through the coil (3), causing the deflectable structure (4A, 4B) to deflect, and either make or break contact with the electrical contacts. The invention includes a unique unpowered hold feature. By integrating an electrostatic actuating capacitor into the micro-relay, an electrostatic force can be generated between the cantilever beam and the substrate (1) of the micro-relay that is strong enough to hold the relay in the "ON" position. Turning the relay "OFF" requires only that the voltage be removed.

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