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(71) Applicant: GEORGIA TECH RESEARCH CORPORATION [US/US]; 505 Tenth Street, NW, Atlanta, GA 30332 (US).

(72) Inventors; and

(71) Applicants : KOHL, Paul, A. [US/US]; 130 Cameron Glen Drive, Atlanta, GA 30328 (US). SAHA, Rajarshi [IN/US]; 121 Center Street, NW, Atlanta, GA 30318 (US). FRITZ, Nathan [US/US]; 2460 Peachtree Road, NW #313, Atlanta, GA 30305 (US).

(74) Agent: GUPTA, Balaram; Promerus LLC, 9921 Brecksville Road, Brecksville, OH 44141 (US).

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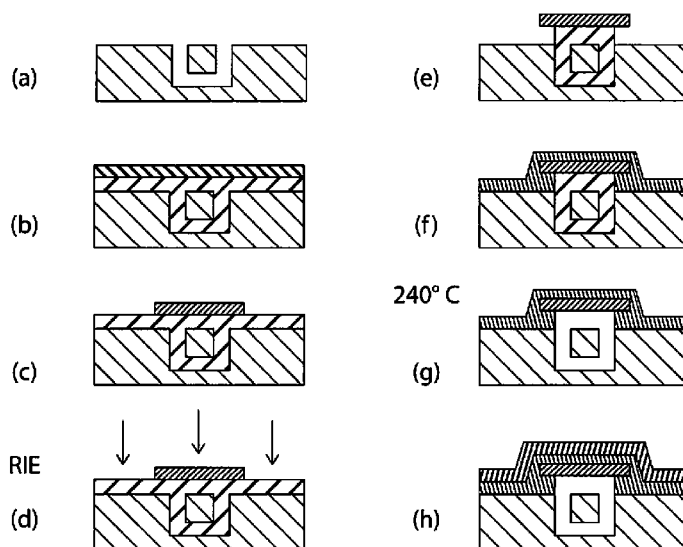
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(54) Title: PACKAGING COMPATIBLE WAFER LEVEL CAPPING OF MEMS DEVICES



(57) Abstract: The movable part of a MEMS device is encapsulated and protected while in wafer form so that commodity, lead-frame packaging can be used. An overcoat polymer, such as, epoxycyclohexyl polyhedral oligomeric silsesquioxanes (EPOSS) has been used as a mask material to pattern the sacrificial polymer as well as overcoat the air-cavity. The resulting air-cavities are clean, debris-free, and robust. The cavities have substantial strength to withstand molding pressures during lead-frame packaging of the MEMS devices. A wide range of cavities from 20 pm x 400 pm to 300 μm x 400 um have been fabricated and shown to be mechanically stable. These could potentially house MEMS devices over a wide range of sizes. The strength of the cavities has been investigated using nano-indentation and modeled using analytical and finite element techniques. Capacitive resonators packaged using this protocol have shown clean sensing electrodes and good functionality.



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- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*