

CMOS COMPATIBLE SURFACE MACHINED PRESSURE SENSOR AND
METHOD OF FABRICATING THE SAME

ABSTRACT OF THE DISCLOSURE

A pressure sensor and method of forming the pressure sensor are described. The pressure sensor is formed by etching a number of trenches in a silicon substrate. Dielectric spacers are formed on the sidewalls of the trenches. The bottoms of the trenches are then etched using isotropic etching to undercut the sidewalls of the trenches and form a number of silicon bridges with a limited gap between the underside of the bridges and the bulk silicon substrate. A filler dielectric is then deposited to fill the gaps between the sidewalls of the trenches thereby forming a flexible membrane. Piezoresistors are formed in the silicon bridges or, alternatively, on the flexible membrane. Pressure changes deflect the flexible membrane causing resistance changes in the piezoresistors which can be monitored and related to pressure. The limited gap between the underside of the bridges and the bulk silicon substrate provides overpressure protection for the sensor.

(Fig. 11)