Investigation of Top/Bottom Electrode and Diffusion Barrier Layer for PZT Thick Film MEMS Sensors

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ABSTRACT

Top and bottom electrodes for screen printed piezoelectric lead zirconate titanate, $Pb(Zr_xTi_{1-x})O_3$ (PZT) thick film are investigated with respect to future MEMS devices. Down to 100 nm thick E-beam evaporated Al and Pt films are patterned as top electrodes on the PZT using a lift-off process with a line width down to 3 µm. A 700 nm thick ZrO_2 layer as insolating diffusion barrier layer is found to be insufficient as barrier layer for PZT on a silicon substrate sintered at 850 °C. EDX shows diffusion of Si into the PZT layer.