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

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Key words: PZT thick film, top electrode, bottom electrode, MEMS, accelerometer, pMUT

ABSTRACT

Top and bottom electrodes for screen printed piezoelectric lead zirconate titanate, Pb(Zr\textsubscript{x}Ti\textsubscript{1-x})O\textsubscript{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\textsubscript{2} layer as insulating 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.