# Abstracts

## Thin-film bulk acoustic resonators and filters using ZnO and lead-zirconium-titanate thin films

*Q.-X. Su, P. Kirby, E. Komuro, M. Imura, Q. Zhang and R. Whatmore. "Thin-film bulk acoustic resonators and filters using ZnO and lead-zirconium-titanate thin films." 2001 Transactions on Microwave Theory and Techniques 49.4 (Apr. 2001, Part II [T-MTT] (Special Issue on Microwave Acoustic Wave Devices for Wireless Communications and Sensing)): 769-778.*

This paper presents the findings of a design, modeling, and fabrication study of ZnO and PbZr/sub 0.3/Ti/sub 0.7/O/sub 3/ thin-film bulk acoustic resonators and filters. Measurements of the high-frequency responses of ZnO resonators having different area are used to develop an acoustic model that accurately represents resonator impedance data. The models are also used to interpret S-parameter measurements on thin-film PbZr/sub 0.3/Ti/sub 0.7/O/sub 3/-based resonators and a value for the effective coupling coefficient deduced. ZnO and PbZr/sub 0.3/Ti/sub 0.7/O/sub 3/ ladder filters were designed based on measured impedance data from single resonators. Ladder filters based on PbZr/sub 0.3/Ti/sub 0.7/O/sub 3/ have been fabricated for the first time. It is shown that the high coupling coefficient in PbZr/sub 0.3/Ti/sub 0.7/O/sub 3/ leads to bandwidths in the range 100/spl sim/120 MHz at a center frequency of 1.6 GHz, larger than the bandwidths of ZnO-based filters.

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