

Parameter Determination of a Rosen Type Piezoelectric Transformer Operating in Second Mode

Faiza Boukazouha, Guylaine Poulin-Vittrant, Louis Pascal Tran-Huu-Hue, Marc Lethiecq

Abstract : In this paper, a single layer Rosen type piezoelectric transformer is produced using a hard PZT piezoelectric ceramic. It is then tested. A theoretical understanding of its operation is developed through 1D analysis based on an analytical solution of a linear system of equations that represents boundary conditions. The method validity was verified experimentally for a transformer operating in second mode and good matching was observed between the computed results and the experimental ones for the unloaded and the loaded transformer, despite some discrepancies. By considering the measured equivalent circuit constants using admittance circles, the fitting is improved.

Keywords : piezoelectric ceramic, PZT, Rosen type