

LONGITUDINAL AND LATERAL VIBRATIONS OF A PLATE PIEZOCERAMIC TRANSFORMER

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S u m m a r y

Recently, the author has investigated the characteristics of a Rosen-type piezotransformer with regard for the difference in elastic compliances of input and output sections. A refined formula has been derived for the transform ratio. It was established that the transform ratio is inversely proportional to the square frequency. This fact explains why the operation of planar transformers at higher modes of vibrations is not effective. The longitudinal mechanical stresses in the excited and generating sections of a transformer are axisymmetric in respect to the separating line that is in good matching with experimental data. In this paper, the previous author's results are used to analyze the modes of vibrations, frequency behaviour of the transform ratio, and input admittance of a transverse-longitudinal transformer. The spectrum of vibrations of the piezotransformer is compared with that of a rectangular piezoelectric plate. It is shown that a piezoplate has more rigid spectrum than a piezotransformer. The couplings between the lateral and longitudinal vibrations in a piezoplate and a piezotransformer are similar.