

Prediction of the Performance of a Bar-Type Piezoelectric Vibration Actuator Depending on the Frequency Using an Equivalent Circuit Analysis

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Abstract : This paper has investigated a technique that predicts the performance of a bar-type unimorph piezoelectric vibration actuator depending on the frequency. This paper has been proposed an equivalent circuit that can be easily analyzed for the bar-type unimorph piezoelectric vibration actuator. In the dynamic analysis, rigidity and resonance frequency, which are important mechanical elements, were derived using the basic beam theory. In the equivalent circuit analysis, the displacement and bandwidth of the piezoelectric vibration actuator depending on the frequency were predicted. Also, for the reliability of the derived equations, the predicted performance depending on the shape change was compared with the result of a finite element analysis program.

Keywords : actuator, piezoelectric, performance, unimorph

Conference Title : ICEET 2014 : International Conference on Electrical Engineering and Technology

Conference Location : London, United Kingdom

Conference Dates : August 21-22, 2014