

Digitized self-oscillating loop for piezoelectric transformer-based power converters - DTU Orbit (08/11/2017)

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A new method is implemented in designing of self-oscillating loop for driving piezoelectric transformers. The implemented method is based on combining both analog and digital control systems. Digitized delay, or digitized phase shift through the self-oscillating loop results in a very precise frequency control and ensures an optimum operation of the piezoelectric transformer in terms of

voltage gain and efficiency. In this work, additional time delay is implemented digitally for the first time through 16 bit digital-to-analog converter to the self-oscillating loop. Delay control setpoints updates at a rate of 417 kHz. This allows the control loop to dynamically follow frequency changes of the transformer in each resonant cycle. The operation principle behind self-oscillating is discussed in this paper. Moreover, experimental results are reported.

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