

Research Migration Project

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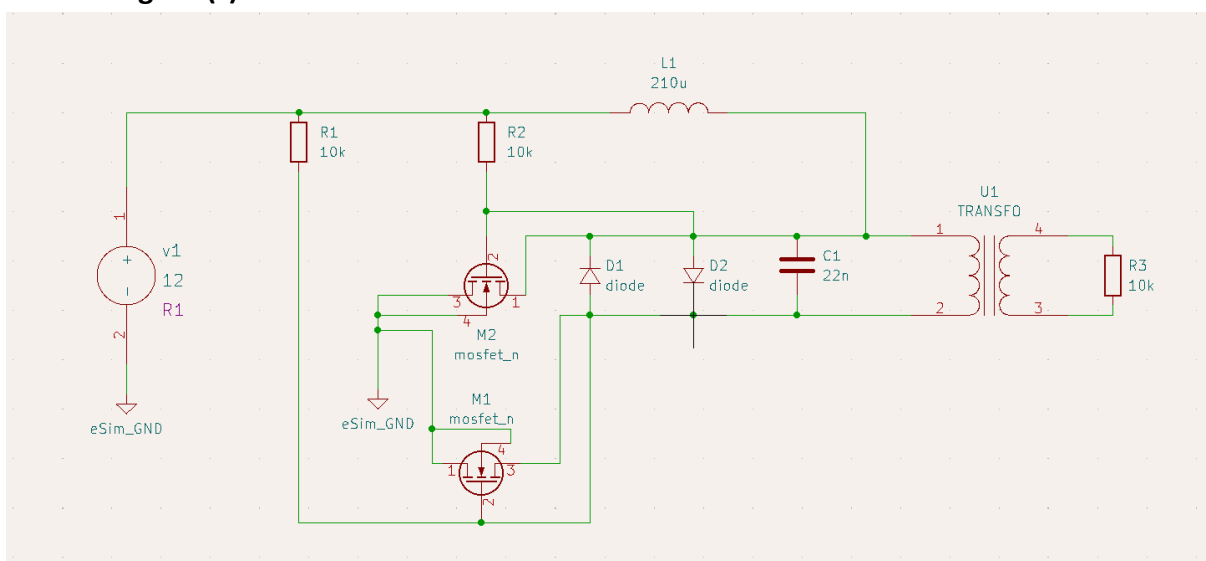
Name of the participant : K.S.Madhavkrishnan

Name of the College : SRM Institute of Science and Technology, Ramapuram Campus

Title of the circuit : Mazzilli Resonant Converter

Theory/Description : The Mazzilli Resonant Converter is a self-oscillating, zero-voltage switching (ZVS) circuit used to efficiently drive inductive loads or step up voltages for devices like plasma tubes and CCFLs. It employs a pair of N-channel MOSFETs and a resonant LC tank, where the transformer provides feedback to control switch timing automatically. When powered by a DC supply, the circuit rapidly alternates conduction between the MOSFETs, allowing resonant energy exchange between inductor and capacitor, which creates high-frequency AC output. Because each MOSFET turns on and off at near zero voltage, the converter minimizes switching losses and stress. This results in higher efficiency, reduced EMI, and improved reliability compared to conventional inverter circuits, making it well-suited for demanding solid-state lighting and high-voltage applications.

Circuit Diagram(s) :



Results (Input, Output waveforms and/or Multimeter readings) :



Source/Reference(s) :

1. Hapidin, D. A., Saleh, I., Munir, M. M., & Khairurrijal. (2017). *Design and Development of a Series-configuration Mazzilli Zero Voltage Switching Flyback Converter as a High-voltage Power Supply for Needleless Electrospinning*. *Procedia Engineering*, **170**, 32–37. Elsevier.
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2. McClusky, S. L. (2010). *High Voltage Resonant Self-Tracking Current Source for Plasma Actuators* (PhD Thesis). University of Nottingham.
<https://core.ac.uk/download/pdf/19136619.pdf>
3. Muthi'ah, A., Hapidin, D. A., & Khairurrijal. (n.d.). *Design of Mazzilli's Zero Voltage Switching (ZVS) Circuit as Plasma Glow Discharge Generator*. *Journal of Physics: Conference Series*.
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4. Eskandari, A. (2025). *A Novel High-Voltage Power Supply Using LCCL Resonant DC-DC Converter*. *SSRN Electronic Journal*.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5082755
5. Andreyck, B. (1997). *Zero Voltage Switching Resonant Power Conversion*. Texas Instruments.
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