

TITLE : Bootstrap Gate Driver Design for High-Side MOSFETs

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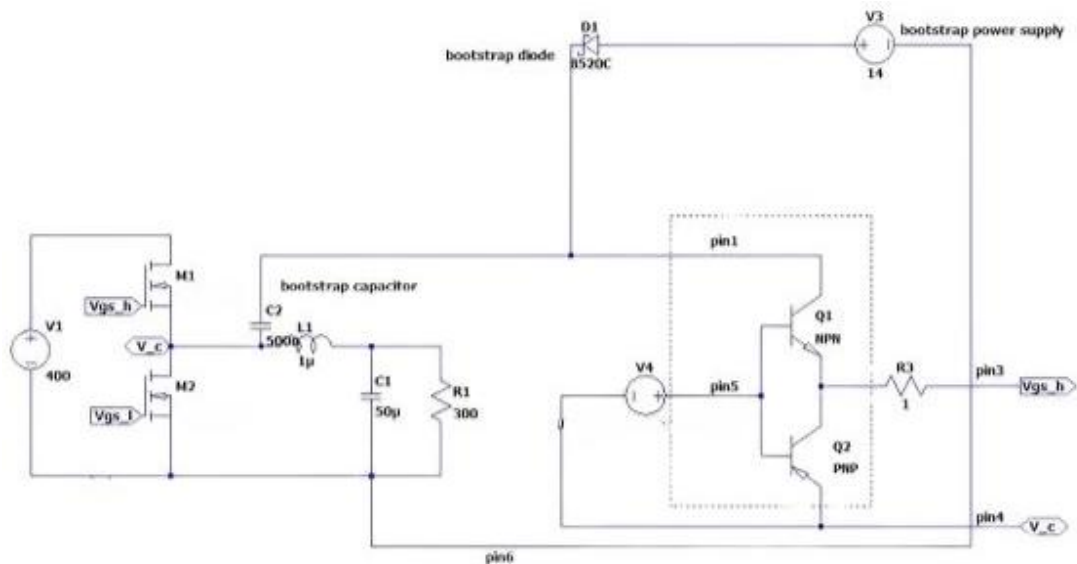
PROBLEM STATEMENT :

Driving the gate of a high-side N-channel MOSFET is challenging because the gate voltage must be higher than the source voltage, which rises to the supply level during switching. This project addresses the design of a bootstrap gate driver circuit, which uses a capacitor and diode to generate the required higher gate voltage from a lower supply voltage, enabling efficient and reliable high-side MOSFET switching without isolated power supplies.

ABSTRACT :

This project designs and simulates a bootstrap gate driver circuit for high-side N-channel MOSFETs. The bootstrap approach uses a capacitor and diode to boost the gate voltage above the supply voltage, overcoming the challenge of high-side MOSFET driving. The simulation verifies effective high-side switching, making it suitable for power electronics and motor control applications.

PROPOSED CIRCUIT :



Bootstrap Gate Driver Design for High-Side MOSFETs

REFERENCES :

1. IEEE Transactions on Power Electronics, "High-Side Bootstrap Circuit Design and Application," 2018
2. Kumar, A., & Ghosh, R. S. (2020). A review of bootstrap gate drivers for MOSFETs. International Journal of Electronics and Communication Engineering.