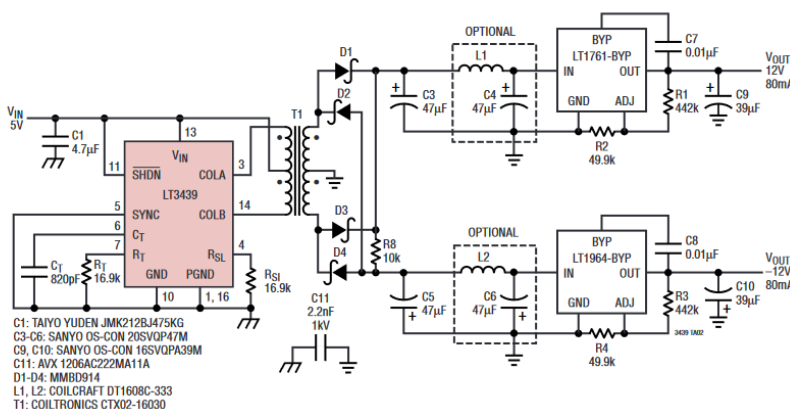


An important part of any power electronic circuit are the gate driver ICs, which provide the gate signals for the power transistors. Typically, these devices are powered by isolated DC/DC converters that generate the positive and negative gate voltages that are then output through the IC. Commercial gate driver supplies are usually available as an all-in-one solution that combines all the required components and provides fixed, unregulated output voltages. However, different types of transistors also have different requirements for their positive and negative gate voltages. Therefore, each type of transistor requires its own gate drive supply with different characteristics. The goal of this work is to create a universal gate driver supply that can be used for both silicon (Si) and silicon carbide (SiC) power MOSFETs, as well as gallium nitride high electron mobility transistors (GaN HEMTs). To enable this flexibility, a suitable converter is to be designed, built, commissioned and evaluated from individual components.

- Evaluation of suitable (isolated) converter concepts and selection of converter components with special attention to compactness and wide controllability of output voltages
- Simulation and design of a suitable supply for SiC MOSFETs (+20V, -5V) and GaN HEMTs (+7V, -10V), nominal power approx. 3 W
- Design of a demonstrator board
- Verification and measurement of the demonstrator



Commercial gate driver supply brick for output voltages of +15V/-5V (Murata Power Solutions Ltd.)