

## Design Ultra Fast Gate Drive Board for Silicon Carbide MOSFET Applications

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**Abstract :** The aim of this paper is to develop an ultra-fast gate driver for Silicon Carbide (SiC) based switching device applications such as AC/DC DC/AC converters. Wide bandgap semiconductors such as SiC switches are growing rapidly nowadays due to their numerous capabilities such as faster switching, higher power density and higher voltage level. Wide band-gap switches can work properly on high frequencies such 50-250 kHz which is very useful for many power electronic applications such as solar inverters. Increasing the frequency minimizes the output filter size and system complexity however, this causes huge spike between MOSFET's drain and source leg which leads to the failure of MOSFET if the voltage rating is exceeded. This paper investigates and concludes the optimum design for a gate drive board for SiC MOSFET switches without causing spikes and noises.

**Keywords :** PV system, lithium-ion, charger, constant current, constant voltage, renewable energy

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