

Isolated Gate Driver Safely Controls SiC MOSFETs

[STMicroelectronics](#)' STGAP2SiCS STGAP family of isolated gate drivers is optimized for the safe control of SiC MOSFETs and operates from a high-voltage rail up to 1200 V. Capable of producing a gate-driving voltage up to 26 V, the STGAP2SiCS has a raised undervoltage lockout (UVLO) threshold of 15.5 V to meet the turn-on requirements of SiC MOSFETs. If the driving voltage is too low, which can be caused by low supply voltage, the UVLO ensures the MOSFET is turned off to prevent excessive dissipation.

With 6 kV of galvanic isolation between the input section and the gate-driving output, the STGAP2SiCS helps ensure safety in consumer and industrial applications. Its 4-A output-sink/source capability is suited to mid- and high-power converters, power supplies, and inverters in equipment such as high-end home appliances, industrial drives, fans, induction heaters, welders, and UPSs.

The driver features dual input pins that let designers determine the gate-drive signal polarity. The input circuitry is compatible with CMOS/TTL logic down to 3.3V, which allows easy interfacing with a wide variety of control ICs.

Two different output configurations are available. One has separate output pins that allow independent optimization of turn-on and turn-off times using a dedicated gate resistor (Fig. 1). The second is featured for high-frequency hard switching, with a single output pin and active Miller clamp (Fig. 2) that limits oscillation of the SiC MOSFET gate-source voltage to prevent unwanted turn-on and enhance reliability.

The STGAP2SiCS features a standby mode that helps cut system power consumption, as well as built-in protection including hardware interlocks to prevent cross conduction and thermal shutdown of both the low-voltage section and the high-voltage driving channel. Matched propagation delays between the low-voltage and high-voltage sections prevent cycle distortion and minimize energy losses. The total delay is less than 75 ns, permitting accurate pulse-width modulation (PWM) control up to high switching frequencies.

Housed in a wide-body SO-8W package that ensures 8-mm creepage within a compact footprint, the STGAP2SiCS is available now priced at \$2.00 in quantities of 1000 units. For more information, see the gate drivers [page](#) or the STGAP2SiCS [page](#) in ST's e-store.

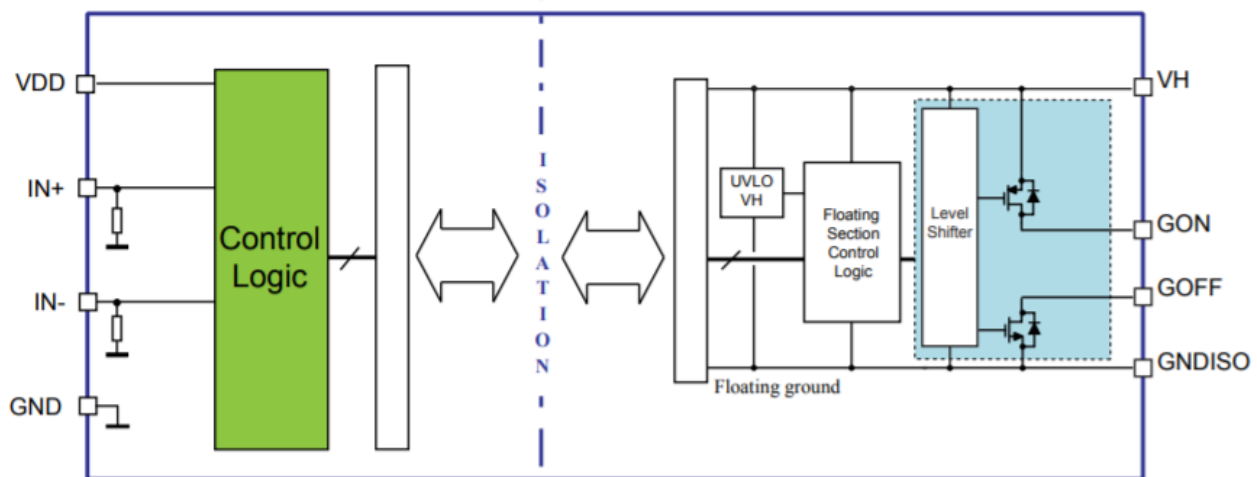


Fig.1 Block diagram of the STGAP2SiCS isolated gate driver for the separate-outputs configuration.

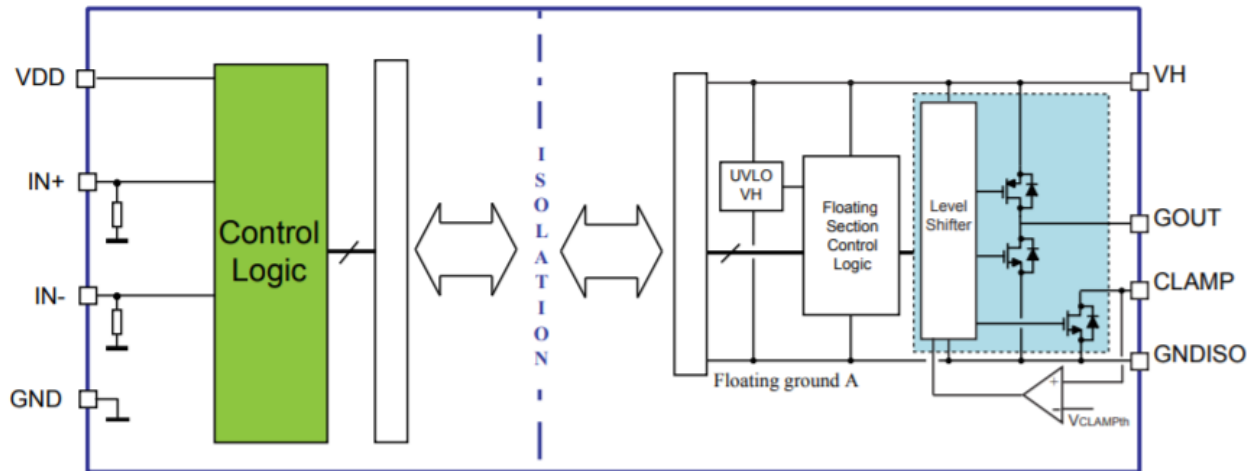


Fig. 2. Block diagram of the STGAP2SiCS isolated gate driver for the single-output and Miller clamp configuration.