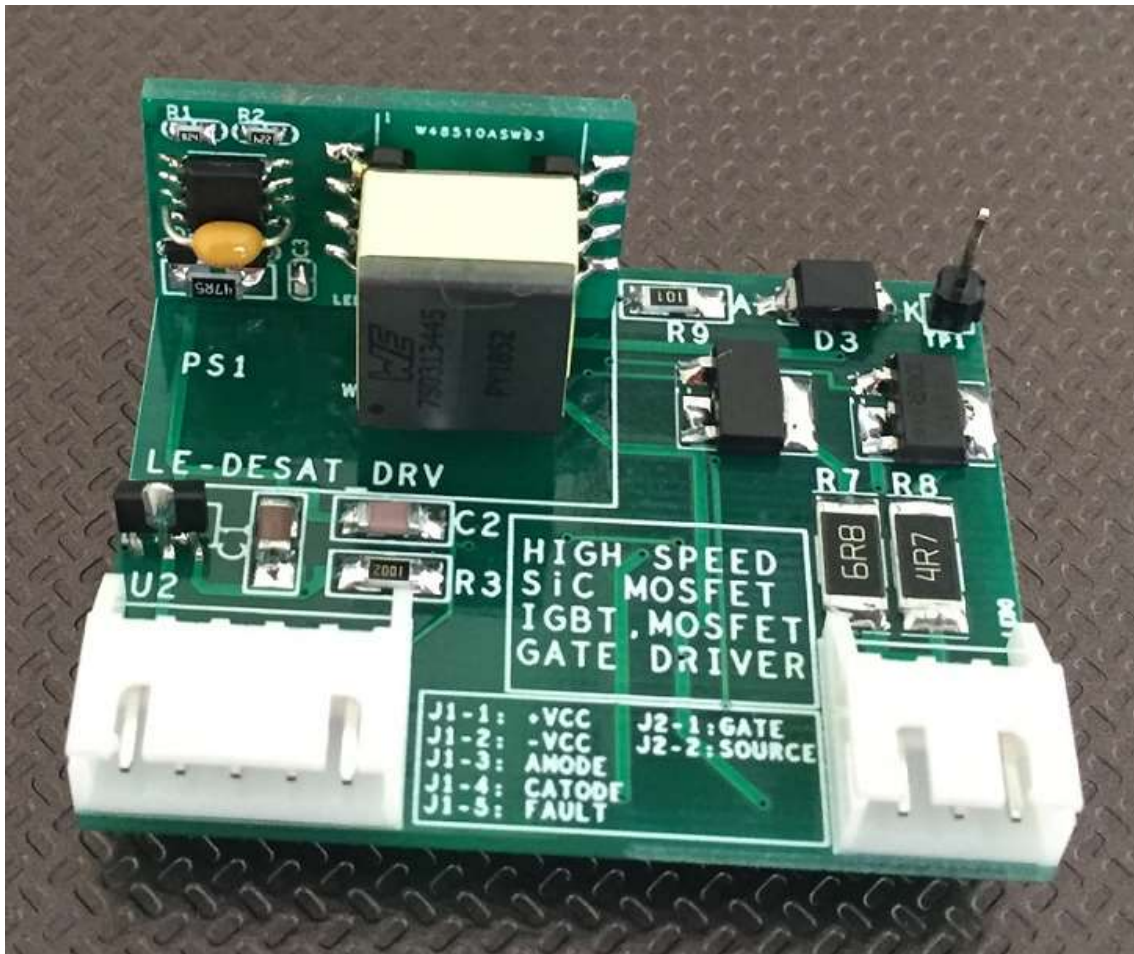


# IGBT GATE DRIVER WITH DESAT PROTECTION



- Supply voltage  $V_{cc}$  10V... 17 V DC
- Rated current input signal: 8 mA
- Optimum operation between DC and 80 kHz
- Maximum working frequency: 300 KHz
- Suitable for controlling large Mosfets / IGBTs
- Compatible with Silicon Carbide Mosfets (SiC MOSFETs)
- Power IGBT Desat Protection
- UVLO protection
- Vertical mounting to reduce space.
- Supports pulses with PWM modulation. Duty cycle between 0 and 100%
- Non-inverting amplifier
- Fully insulated driver
- Short circuit or overload alarm

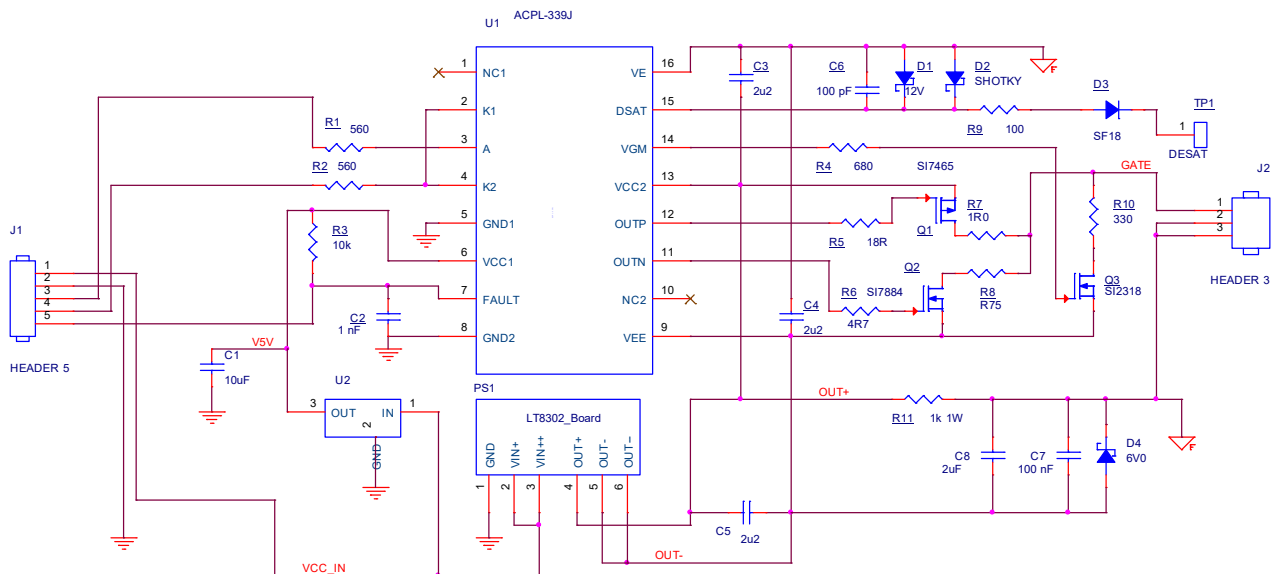


Fig.1. Gate Driver Schematics.

The circuit is based on the classic connection of the Avago ACPL-339J CI, one of the best gate drivers of all that exist on the market (see datasheet). The use of the isolated DC-DC converter Le-LT8302 or Le-DCDC-24 from Ledoelectronics guarantees an isolation of the driver through the 4 KV. The isolation by the input also exists, since the signal input of the IC U1 is carried out through an opto internal coupler.

We are in the presence of a professional gate amplifier capable of optimally controlling any medium and high power MOSFET or IGBT covering a wide frequency range from 0 Hz to 200 kHz.

Yes, it is true that, from a working frequency of 80 kHz, the protection of the transistor that is controlled can no longer be used, since the mechanism for detecting its output from the saturation state needs a minimum time of bleaching of 3.5 us. For frequencies above this value, the short circuit detection network must be deactivated.

To work safely beyond 200 kHz, it is recommended to use forced ventilation of the driver, to extract the heat dissipated in resistors R7 and R8 and in transistors Q1 and Q2.

The output signal voltage at the gate of the transistor that is controlled varies between + 18V and -5V in relation to the supplier or emitter, which guarantees high immunity against noise, and constitutes the ideal levels for maximum performance. of almost all MOSFETs and IGBTs present in the market. It is recommended to read the data sheet of the IC ACPL-339J, to consult in detail all the static and dynamic parameters, and to understand the mechanism of operation of the protection against desaturation.

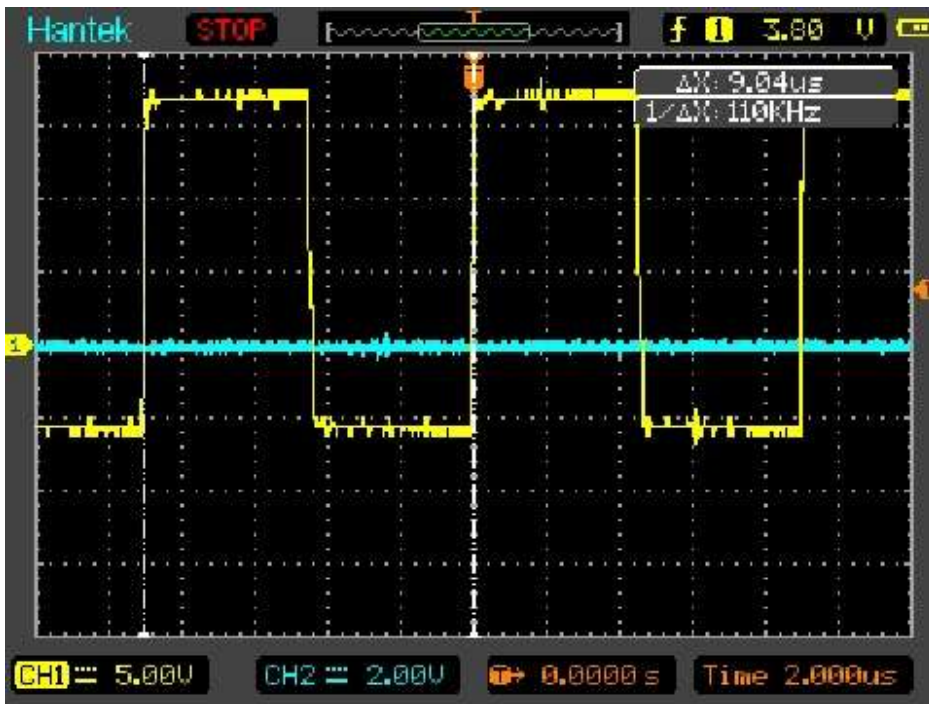


Fig.2. Shape of the output wave at the SiC MOSFET M0040120D gate at a frequency of 110 kHz.

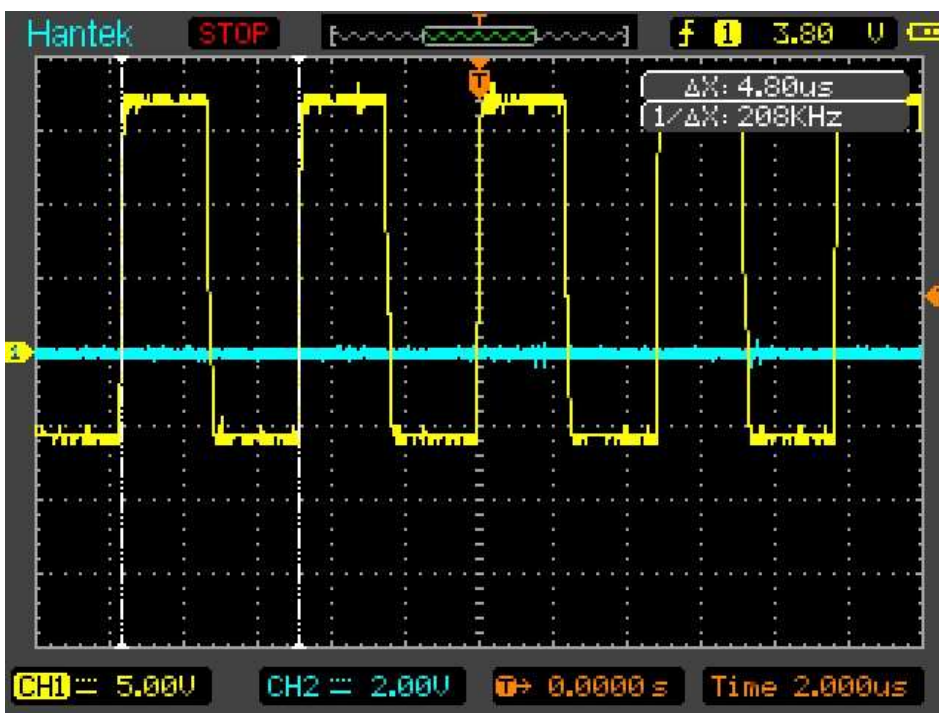


Fig.3. Shape of the output wave at the SiC MOSFET M0040120D gate at a frequency of 208 kHz.

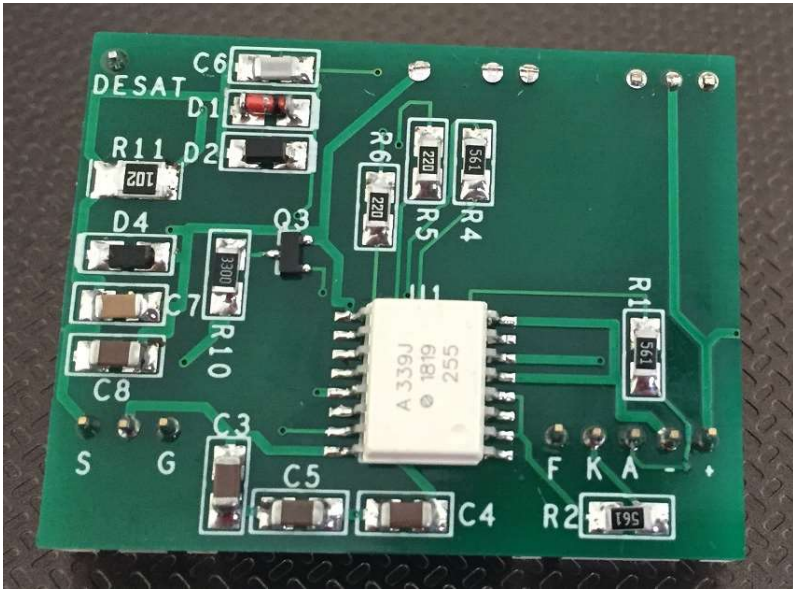


Fig.4. Driver back side.

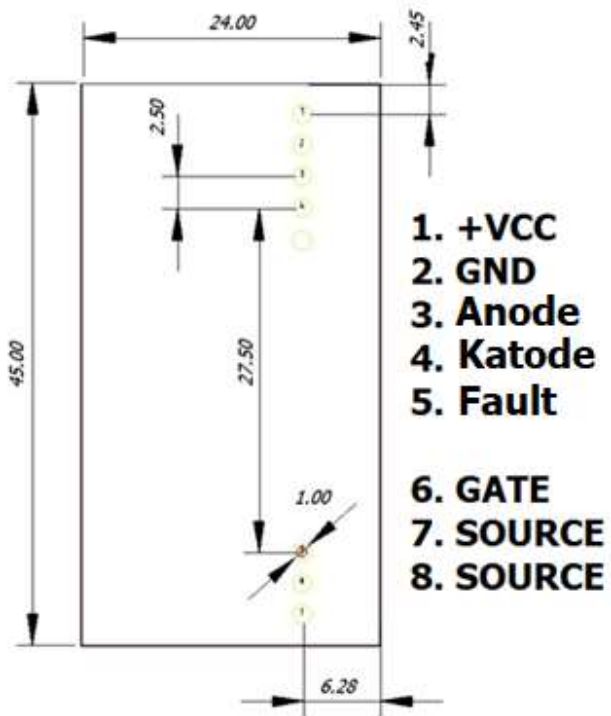


Fig.5. PCB Footprint.