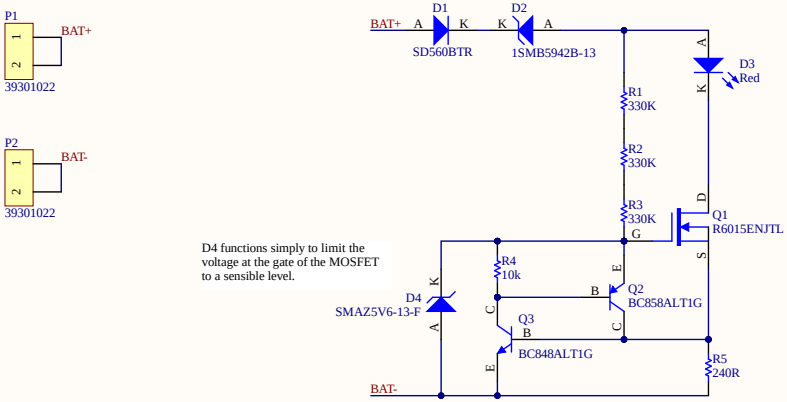
https://www.edn.com/design/analog/4363797/Circuit-achieves-constant-current-over-wide-range-of-terminal-voltages



D4 functions simply to limit the voltage at the gate of the MOSFET to a sensible level.

Q2 & Q3 function as an SCR (Silicon Controlled Rectifier). R60 essentially does nothing, however ensures that its default state is active.

R5 Limits the current through the gate. It is not the primary source of limitation however since the FET is in constant current mode, however will affect this.

Consider the ititial state; above 58V, current will flow through R57-59, and the combined V_CE drop across Q9-10 will be the voltage at the gate. The FET will be on.

If there is current is flowing, this implies a voltage drop across R61. This voltage drop will block drop the votlage at the gate to 0.

At this point, we return to the initial state, where there is no current flowing through the FET, so the SCR will have a voltage drop across it, and current will flow through the FET and LED, which turns it off, etc

This holds the voltage at the gate around 3.4V, a where the current is determined by R61

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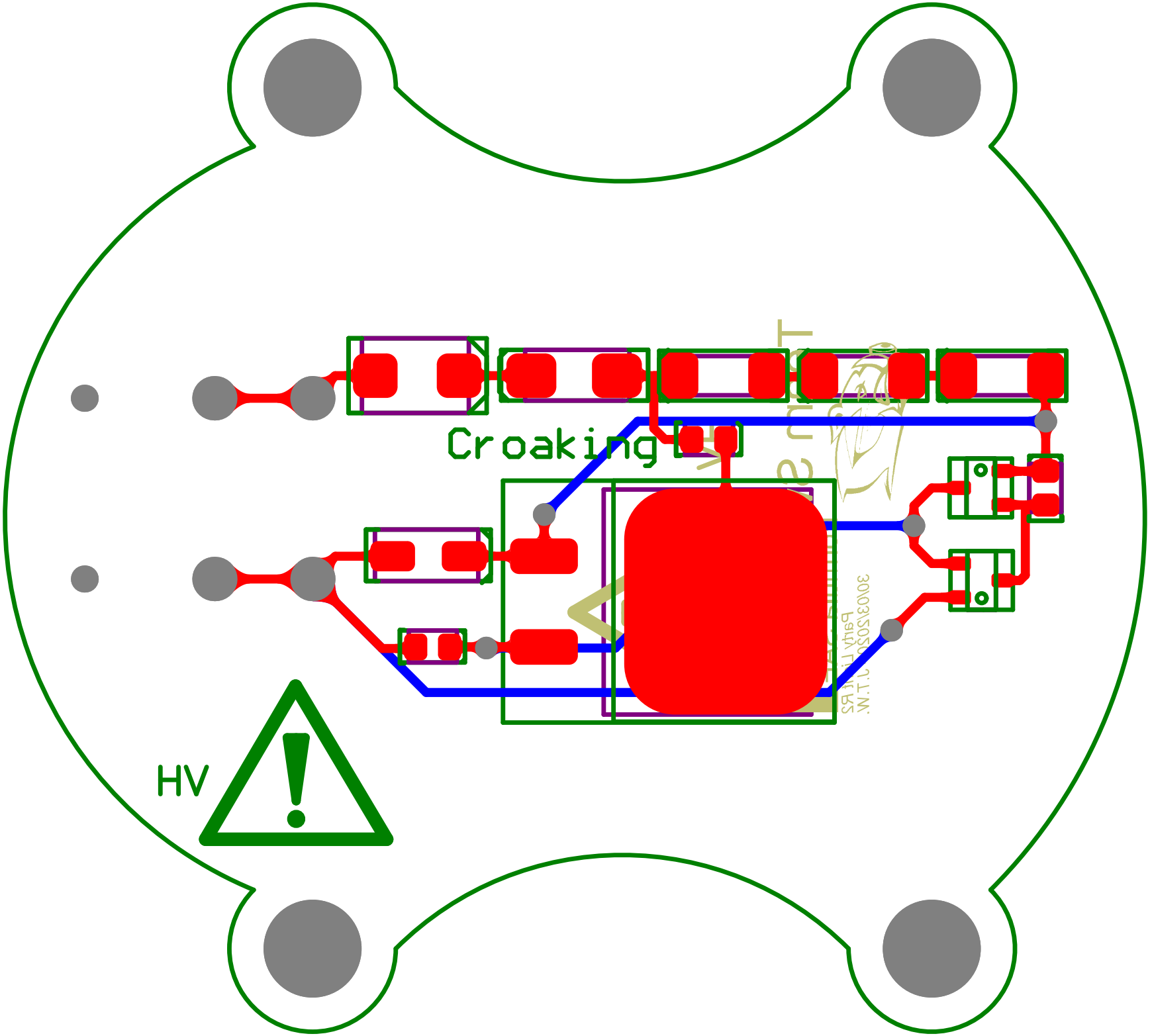
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