Return of the More MOSFET Follies

The LED-Photovoltaic isolator enables some great applications by making it possible to have a high voltage MOSFET switch which is completely floating. These devices use an LED to generate a gate voltage drive, and include fast turn off circuitry to turn the MOSFET off quickly.

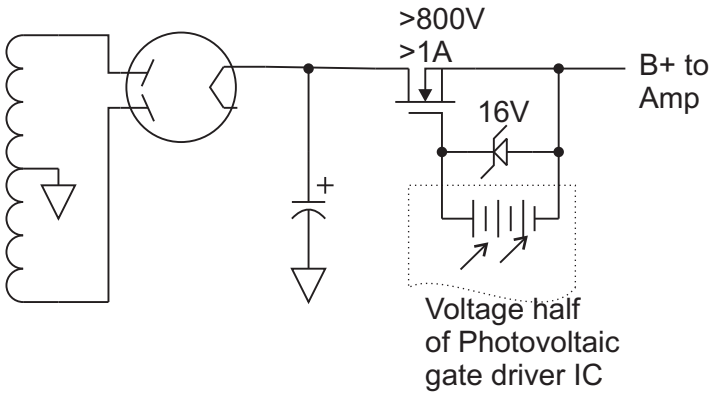
At left is a way to put a vacuum tube amplfier into standby or in some kind of tube-disaster turn off the B+ entirely - and quickly!

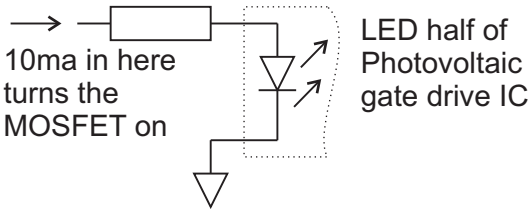
The LED/PV turns the MOSFET on with 10ma into the LED, and off with no current. This takes about 1-10mS to do, which sounds slow, but is in fact much faster than a fuse could cut off current in most circumstances. I haven't shown how the LED is driven. It can be anything you imagine that gets current into the LED and stops it when needed.

This same idea works just as well before the first filter cap as it does after it, with the possible exception that the filter cap will continue to provide current to the amp after the MOSFET switches off, until the cap's stored charge runs down. This may or may not be a good thing in your application. Also notice that the body diode of the MOSFET will conduct from the amp back into the power supply. This might be a problem or an advantage, but it's there.

It's possible to integrate this with the rectifier current clamp idea. You can use a small, but high voltage MOSFET to turn off the gate drive through R1 in that earlier circuit as shown at right. R3 is added to positively run down the gate charge on Q1 and keep it from turning off very, very slowly. R3 is large valued.

Of course, you can also just use a second large MOSFET and put that in series with Q1's drain or source for shutoff.





LED/PV module can be Panasonic APV1/2, Vishay VO1263, IRF, AVAGO...