

Re: MOSFET driver killed with no particular reason

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All Bridge drivers have the potential for short-circuit failure unless there is a safety circuit to prevent this. With separate drive circuits for simultaneous complementary switching, it is crucial to control the switch delay to allow some dead-time in the switches and have each one protected for reverse pulses. Asymmetric delays for rising and falling pulses and reactive loads all contribute to this risk. Try to design the pulse delays so that the turn-off delay is always shorter than the complementary switch's turn-on delay. This can be controlled by adding turn-on delay only in the pre-driver signal to compensate for the natural longer off delay of the switch. Examine worst case time delays with temperature effects and best case to calculate the dead-time needed to avoid short-circuiting the high-side and low side switches through each other to power. A power transistor will have a safe operating area for voltage and current but also look for deratings from thermal effects and pulse speed. Once these limits are all observed, your MOSFETs will last a long happy life.

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