

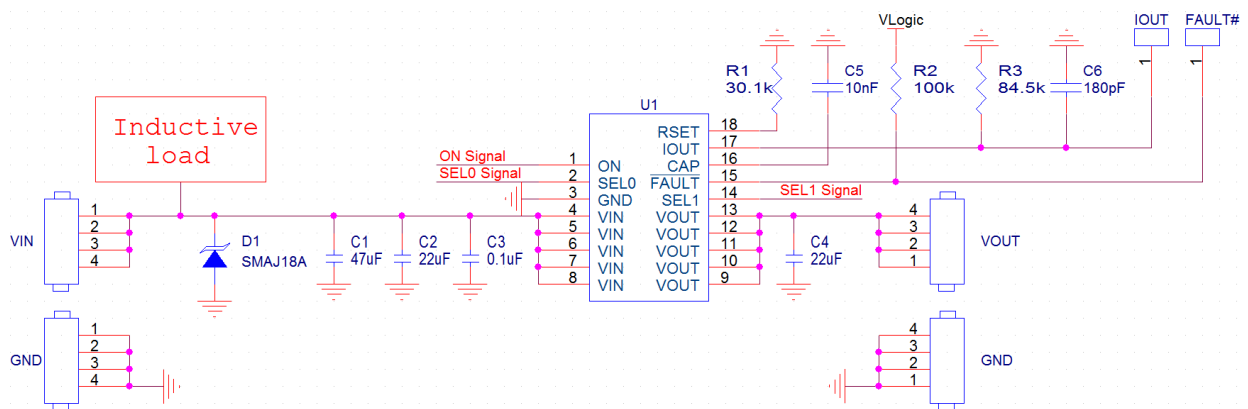
**Introduction**

Electrical transients in the form of voltage surges have existed in all electrical distribution systems. All electrical and electronic devices can be damaged by excessive voltage transients. The difference between them is the amount of energy they can absorb before damage occurs. Generally, surges occur in applications with inductive loads, such as motors, solenoids or relay coils when switched on and off. Inductive switching transients are silent killers of semiconductors as they often occur without advanced warning. In this application note, we represent a way to protect Dialog's High Voltage GreenFET devices from inductive surges using simple TVS.

**Transient Protection of High Voltage GreenFET Circuit Design**

Illustrated in Figure 1, a TVS (transient voltage suppressor) is used to protect High Voltage GreenFET from high positive inductive overvoltage spikes created by motor switching on and off or any inductive loads which are connected to the same VIN

power rail. A TVS is a transient voltage suppressor designed to clamp quickly whenever a large voltage transient is higher than its trigger threshold. High Voltage GreenFET Load Switches could easily stand off 30 V VIN, so to protect device from undesired voltage spikes higher than 30 V, it is necessary to use SMAJ18A TVS that has 29.2 V clamping voltage level. It is very important to take into account TVS's clamping voltage parameter that should be lower than max High Voltage GreenFET VIN voltage. To choose a proper TVS, it is also necessary to consider a max current that the inductive stress could supply. Once this fault current level is known, a TVS with sufficient current-handling margin is selected. This way, one might be certain that the High Voltage GreenFET circuit would resume nominal operation once the inductive voltage transient no longer persists.



**Figure 1. Transient Protection of High Voltage GreenFET using TVS**

### Conclusion

Using TVSs is an easy way to protect Dialog's High Voltage GreenFET devices from fast

inductive overvoltage spikes. TVSs are generally used in all electronic equipment that contain motors transients, solenoids or any inductive loads.

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