

# Energy Recovery of Dimmer Turn-on Spike

## ■ Description

- ▶ Detects the leading edge of a phase controlled input signal through the rising spike of the input current or input voltage when a dimmer turns on
- ▶ Energy from the spike is captured across a resistor then filtered and stored on a capacitor. The stored energy can be used for any control purpose
- ▶ Recovered and stored energy may be used to generate a control signal to maintain input current above the minimum holding current of the dimmer by either:
  - Engaging an active current compensator (i.e. bleeder)
  - Modifying the feedback control signal

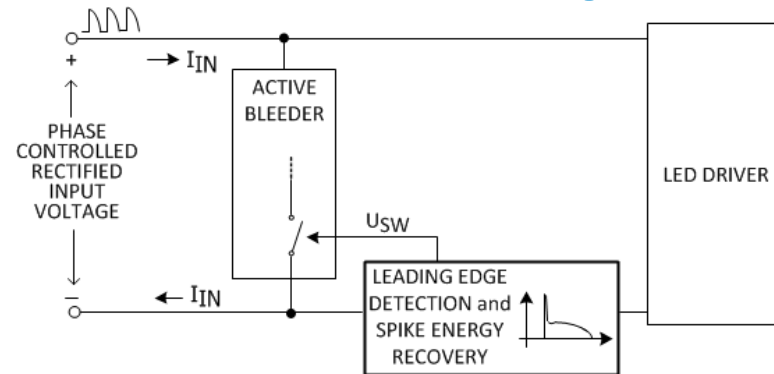


Figure 1. Recovered spike energy used to engage an active bleeder

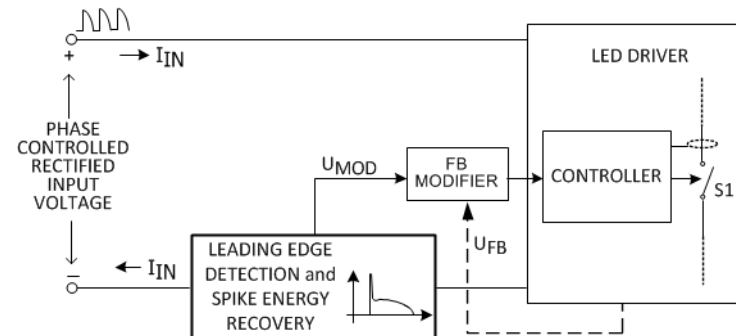


Figure 2. Recovered spike energy used to modify the feedback signal

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## ■ Benefits

- ▶ Light emitting diode (LED) drivers with leading edge dimming may achieve no flicker, smooth dimming
- ▶ Reduces loss and heat dissipation and increases efficiency
- ▶ Activation of the bleeder can be auto-synchronized with the turning on of the dimmer
- ▶ Modified feedback signal increases load demand and maintain the input current above the holding current

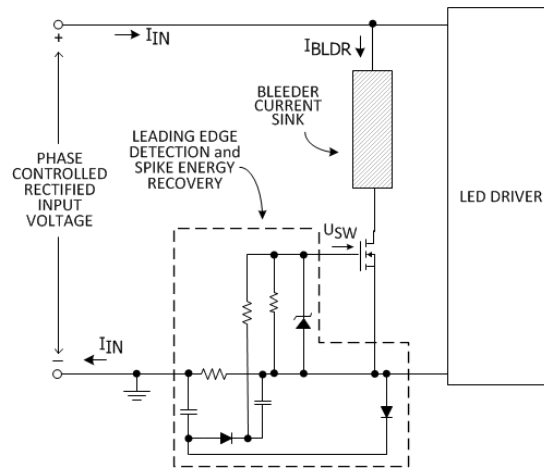


Figure 3. Example spike energy recovery circuit to engage bleeder

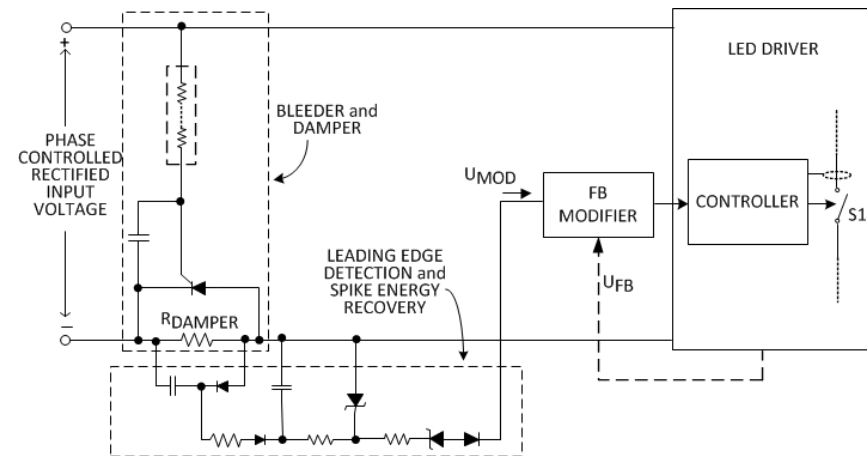


Figure 4. Example spike energy recovery circuit to modify feedback signal