

Enhanced Active Preload for TRIAC Stability

■ Description

- ▶ An enhanced active preload at the output of the power converter maintains the input current above the minimum holding current of a TRIAC dimmer
- ▶ Activation circuit turns on activation transistor (Q2) in linear mode when the load current drops below a threshold
- ▶ Activation transistor turns on the preload transistor (Q1) in linear mode to sink current which is inversely proportional to the load current
- ▶ At loads higher than the threshold, the activation transistor saturates and disconnects the enhanced active preload
- ▶ A Zener circuit may be added for fast activation at output overvoltage (OV)

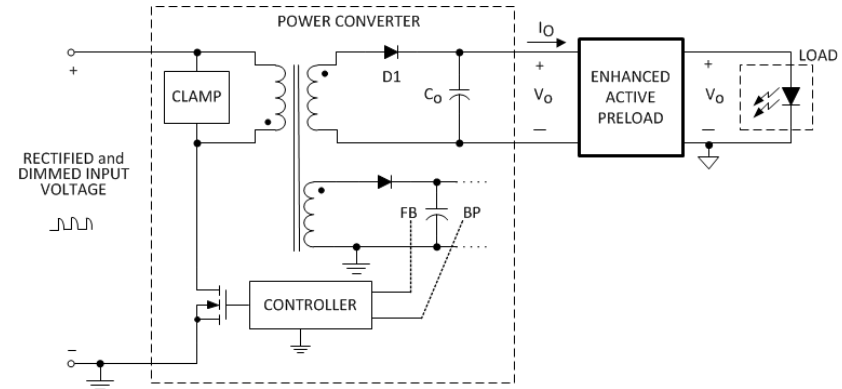


Figure 1. Flyback power converter with enhanced active preload at output

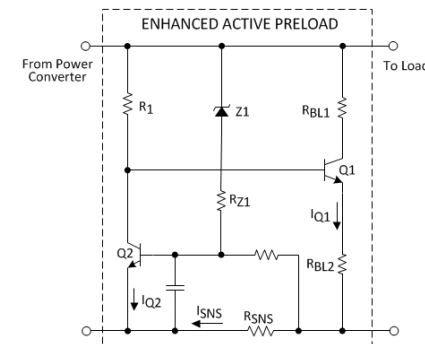


Figure 2. Enhanced active preload coupled to the output of the power converter and response to the load

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■ Benefits

- ▶ Above the load threshold, there is no loss and no effect on efficiency
- ▶ Below the load threshold, sinks an auto adjust current which is inversely proportional to load
- ▶ May be used with a wide variety of power converters, such as flyback, buck or buckboost
- ▶ Location and components of enhanced active preload may be customized based on application

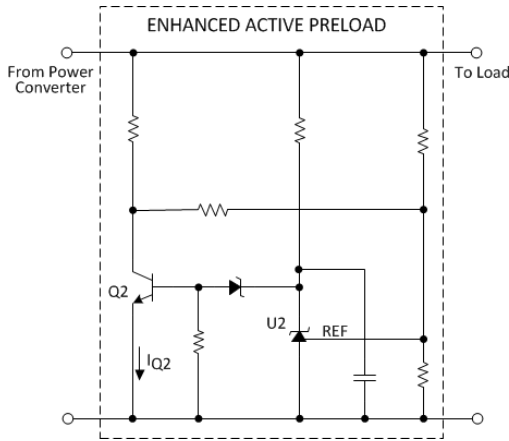


Figure 3. Enhanced active preload coupled to the output of power converter

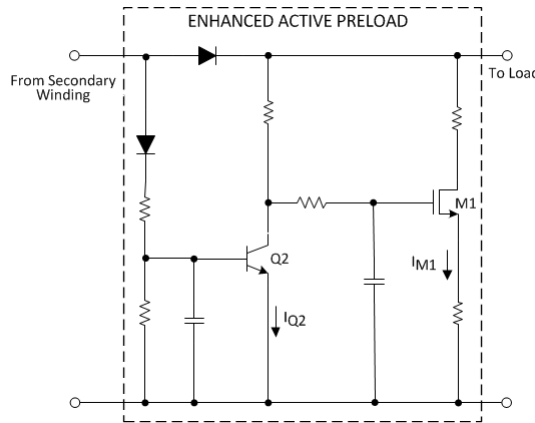


Figure 4. Enhanced active preload coupled at the secondary winding and is responsive to the TRIAC phase angle

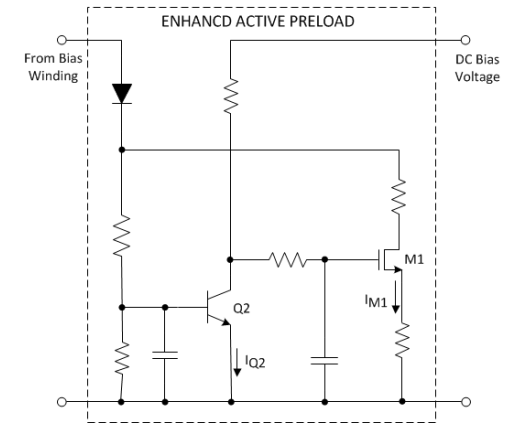


Figure 5. Enhanced active preload coupled to the bias winding and is responsive to changes in bias voltage