



## NXP GreenChip SMPS control IC TEA1836

# Deliver high-performance SMPS control in low-cost applications

This highly integrated SMPS controller, designed for DCM/QR flyback topologies in power supplies up to 75 W, brings a new level of performance, efficiency, and protection to low-cost applications.

### KEY FEATURES

- ▶ Universal mains supply operation (70 to 276 V AC)
- ▶ < 30 mW no-load standby power dissipation with output high and full regulation
- ▶ Automatic burst-mode prevents audible noise and enables high efficiency at low loads while keeping output in full regulation
- ▶ Powerdown function, lowering no-load power to < 20 mW or even lower
- ▶ Quasi Resonant mode, NXP-patented true valley switching enabling minimum switching losses
- ▶ On-chip high-voltage startup current source
- ▶ Integrated active X-cap discharge
- ▶ Brownout protection
- ▶ Peak power capability up to 150% and integrated OverPower timer
- ▶ Integrated mains independent OPP, Demag protection, accurate OVP and OTP

- ▶ Robust MOSFET driver stage, driver maximum on-time protection
- ▶ Low tolerance on Vsense (< 5%)
- ▶ Low UVLO level (~10 V) for low standby power and high efficiency at low loads
- ▶ Available in SO14 package (TEA18361) and SO8 package (TEA18362 / TEA18363)

### APPLICATIONS

- ▶ Power supplies operating at typically up to 75W

The NXP TEA1836 Switched Mode Power Supplies (SMPS) controller IC makes it easy to design low-cost, highly efficient and reliable supplies for power requirements typically up to 75W with a minimum number of external components.

The device includes special features – such as brownout protection, peak power capability up to 150%, an integrated active X-cap discharge, and an automatic burst mode – and has built-in green functions that provide high efficiency at all power levels.



At high power levels, the flyback operates in QR mode. When lowering the power level, the controller switches to Frequency Reduction (FR) or DCM mode and limits the peak current to around 25% of the maximum peak current.

At low power levels, when the flyback switching frequency drops below the ~25 KHz, the flyback converter switches to burst mode.

To ensure high efficiency at low power and excellent no-load power performance, a special burst mode has been integrated that minimizes the opto current. The switching frequency in this mode has a minimum value of ~25 KHz, and the burst frequency is always below 800 Hz, guaranteeing the frequencies are outside the audible range.

During the non-switching phase of burst mode, the internal IC supply current is minimized to further optimize low load efficiency. Valley switching is used in all operating modes.

The TEA1836 includes an accurate OverPower Protection (OPP). This enables the controller to operate under overpower situations for a limited amount of time. In case of a shorted output, the system switches to a special low-power mode.

The TEA1836 is implemented in a specialized, high-voltage SOI (Silicon on Insulator) process. As a result, the controller combines the advantages of a low-voltage process, such as accuracy, high-speed protection functions, and control, with high-voltage benefits such as high-voltage startup and integrated X-cap discharge.

### TEA1836 application diagram

