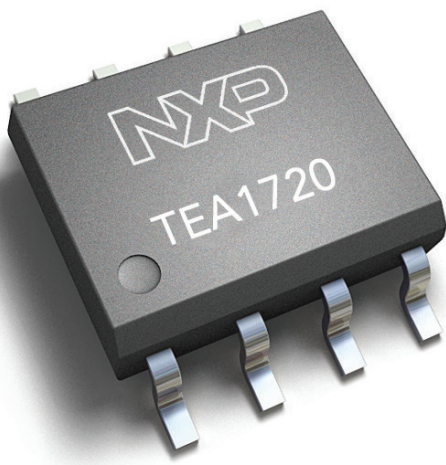




NXP GreenChip HV start-up flyback controller TEA1720A

Cost effective, ultra-low standby and high performance battery charging

Equipped with integrated HV start-up current source, the TEA1720A is a highly efficient low-power SMPS controller that can be combined with the TEA1705 transient interrupt device to deliver exceptionally fast dynamic load response.

Key features

- ▶ Fast transient response when used in combination with TEA1705
- ▶ Primary sensing of output voltage control eliminates opto coupler and secondary circuitry
- ▶ Minimizes audible noise in all operating modes
- ▶ USB battery charging and Energy Star 2.0 compliant
- ▶ Jitter function for reduced EMI
- ▶ Cable compensation of 0.3 V at maximum power
- ▶ Green features
 - Enables no-load power consumption below 10 mW
 - Very low supply current in no-load condition with energy-save mode
 - HV start-up circuit with zero current consumption under normal switching operation
- ▶ Comprehensive protections
 - OverVoltage Protection (OVP) with auto-restart
 - UnderVoltage LockOut (UVLO) and OVP protection on IC supply pin
 - OverTemperature Protection (OTP)
 - Soft-start by reduced peak current for zero and low output voltage

- Demagnetization protection for guaranteed DCM mode
- Open and short-circuit protection for guaranteed discontinuous conduction mode operation
- Short-circuit protection of the charger output
- ▶ Available in halogen-free and RoHS SO8 package

Applications

- ▶ Battery chargers for smartphones and media tablets up to 12 W
- ▶ Standby supply for TV and desktop PCs

The NXP TEA1720 is a small, low-cost Switched Mode Power Supply (SMPS) controller IC that operates directly from the rectified universal mains input. Primarily designed for phone and media tablet chargers operating up to 12 W, the GreenChip TEA1720A includes an emitter switch for driving an external low-cost bipolar power transistor. It has been optimized for flyback converter topologies and provides high efficiency over the entire load range with ultra-low power consumption in the no-load condition. It also includes a circuit for start-up directly from the rectified mains voltage without any external bleeder circuits.



The TEA1720A can be used in combination with the NXP TEA1705 transient interrupt device to create a system that delivers very fast transient response times. With the GreenChip TEA1705 at the secondary side, the system combines very tight transient response ($5\text{ V} \pm 5\%$) with small output capacitors and very low no-load power up to 12 W.

The TEA1720A/TEA1705 combination delivers integrated HV start-up, ultra-low no-load power <10 mW, improved CC mode accuracy of less than 10%, and external low-cost NPN power transistor. The TEA1720A/TEA1705 combination is also compliant to the USB 1.1 and 1.2 charging specifications. The result is a low-power converter built at minimum cost and with a minimum number of external components.

TEA1720A operation

The TEA1720A operates as a regulated voltage source from no-load up to the maximum output current and operates as current source that delivers the maximum current over a broad output voltage range.

The controller regulates the output voltage with primary-side sensing, which eliminates the need for an additional secondary feedback circuitry and simplifies the design. At higher power levels, a frequency and current control mode is used. It operates with Burst mode control at low power levels and no-load condition. The Burst mode minimizes audible noise and provides an energy-save state which reduces the power consumption in no-load condition. The Burst mode frequency of 200 Hz enables no-load power consumption below 10 mW at high mains input.

TEA1720A/TEA1705 application diagram

