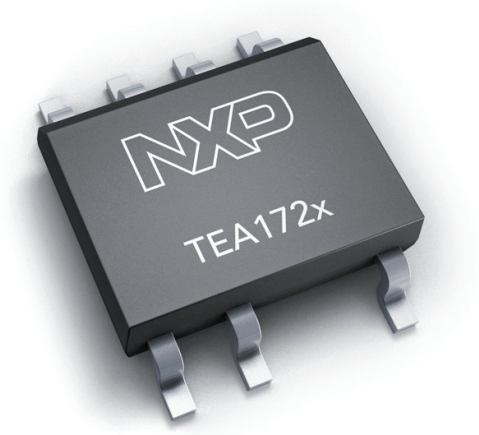


NXP GreenChip low power SMSP controller TEA172x

Ultra-low standby, cost-effective power supplies up to 11 W

These highly integrated devices enable low no-load power consumption below 10 mW, reduce component count for a cost-effective application design, and provide advanced control modes that deliver exceptional efficiency.

Key features

- SMPS controller with integrated power switch up to 5 or 11 W
- 700 V high-voltage MOSFET for global mains operation
- Primary sensed output voltage control eliminates opto coupler
- Operates with advanced control modes for optimal performance and high efficiency
- Variable switching frequency up to 50.5 kHz
- EEPROM-programmable burst frequencies create flexibility between transient response and no-load power consumption
- Avoids audible noise in all operating modes (min f_{sw} > 22 kHz)
- Includes compensation of cable impedance
- Jitter function for reduced EMI
- USB battery charging (CC/CV) and Energy Star 2.0 compliant
- Enables no-load power consumption below 10 mW
- High-voltage start-up with zero current under normal switching operation
- Safe restart mode for system fault conditions
- OverVoltage Protection (OVP) with auto-restart
- UnderVoltage LockOut (UVLO) and clamp protection
- OverTemperature Protection (OTP)
- Soft-start by reduced peak current for zero and low output voltage
- Demagnetization protection for guaranteed DCM mode
- FB open pin and short-circuit protection
- Available in halogen-free and RoHS SO7 package with HV spacing

Applications

- Mobile USB chargers
- Battery chargers for smartphones and media tablets
- Power supplies for white goods
- Industrial systems, including smart meters

The NXP TEA172x family is a series of small, low-cost module Switched Mode Power Supply (SMPS) controller ICs that operate directly from the rectified universal mains input and are tailored for low-power applications up to 5 or 11 W. Each device is equipped with a high-voltage power MOSFET switch (700 V) and is optimized for flyback, buck, and buck-boost converter topologies. The result is high efficiency over

the entire load range. Power consumption in the no-load condition below 10 mW at 5 W, which exceeds the EPA 2.0 rating and the 5-star rating defined by EnergyStar.

The TEA1721 supports operation up to 5 W and is ideally suited for use in mobile USB chargers, major home appliances, and industrial systems. The TEA1723 runs at up to 11 W and targets tablet PCs, e-readers, and set-top boxes (STBs). All three TEA172x devices have the same feature set but use a different power MOSFET, tailored for operation up to 5 or 11 W, respectively.

The TEA172x architecture provides a circuit for start-up directly from the rectified mains voltage without any external bleeder circuits. The converter operates as a regulated voltage source from no-load up to the maximum output current and operates as a current source that delivers the maximum current over a broad output voltage range.

The architecture includes several features that serve to reduce total component count, minimize the design footprint, and lower overall cost. Primary side-sensing, which eliminates the need for a power-consuming opto-coupler. The architecture meets EMI specification without an external Y-cap, and integrated active HV start-up eliminates resistor bleeder circuitry. Fewer than 30 external components are required for a complete bill of materials.

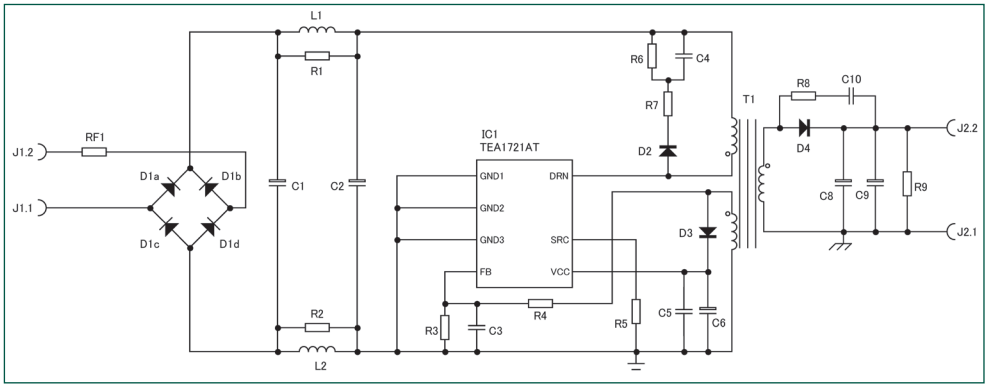
Advanced control modes enable very high average efficiency (above 77%) over the entire load range, and compliance with USB 1.1 and 1.2 makes them well suited for use in mobile phone charger applications. Switching losses are kept low with a burst frequency of 430 Hz, and a variety of protection features ensure reliable operation under a wide range of conditions.

Design tools for the TEA172x family include a range of demo boards, extensive application notes, and an online calculator that helps predict real-world performance.

Selection guide

Product		Cable comp (Ω)	Power (W)	No-load (mW)	Fswitch (kHz)	Fburst (Hz)	CV	CC	Package	Applications
TEA1721	AT	0	5	< 10	50.5	430	±5%	±10% +Lp	SO-7	White goods, industrial, smart meters, mobile USB chargers, general-purpose adapters
	BT			< 15		905				
	DT			< 20		1270				
	FT			< 25		1750				
	A1T	0.3		< 10		430				Mobile USB chargers
	B1T			< 15		905				
	D1T			< 20		1270				
	F1T			< 25		1750				
TEA1723	AT	0	11	< 20	50.5	430	±5%	±10% +Lp	SO-7	White goods, industrial, smart meters, chargers for smartphones and media tablets, general-purpose adapters
	BT			< 30		905				
	DT			< 40		1270				
	FT			< 50		1750				
	A1T	0.3		< 20		430				Chargers for smartphones and media tablets
	B1T			< 30		905				
	D1T			< 40		1270				
	F1T			< 50		1750				

TEA1721AT application diagram



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