

Synchronous-Rectification Controller Cuts BOM Costs For Power Adapters

[STMicroelectronics'](#) SRK1001 secondary-side synchronous-rectification controller introduces adaptive features that cut bill-of-materials (BOM) costs, minimize circuit size, and simplify the design of power adapters, chargers, USB Power Delivery outlets, and lighting power supplies based on flyback topologies (see the figure). Designed for fast turn-on with minimum delay, and introducing innovative adaptive turn-off logic, the SRK1001 maximizes synchronous-rectification MOSFET conduction time for optimum efficiency with minimal switching losses.

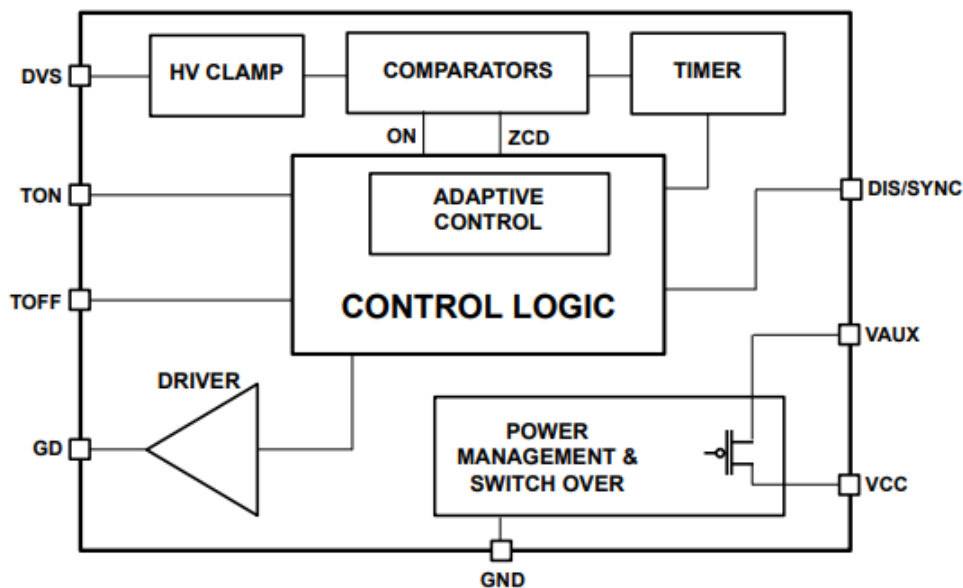
According to the vendor, unlike other controllers on the market, the SRK1001's advanced design requires no external compensation circuitry to eliminate parasitic-inductance effects. The SRK1001 is also said to ensure superior converter efficiency at light loads, where synchronous rectification is no longer beneficial. The device automatically enters low-consumption mode when the MOSFET conduction period reaches the programmed minimum on-time or when burst-mode operation of the primary controller is detected. The quiescent current in this mode is just 160 μ A.

Versatility is another strength of the SRK1001, allowing use in quasi-resonant converters and mixed continuous/discontinuous current mode (CCM/DCM) fixed-frequency operation at up to 300 kHz. Robustness is assured, with programmable blanking time after both turn-on and turn-off to prevent noise from inducing spurious behavior.

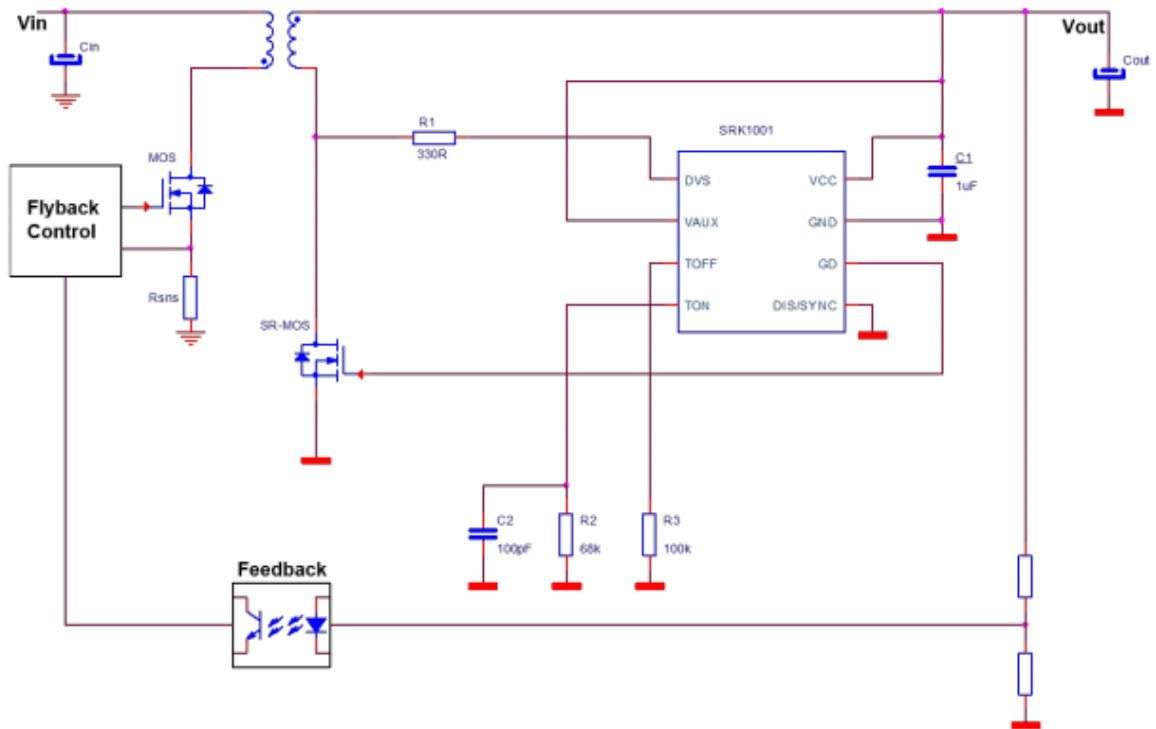
Suitable for applications with output voltage up to 24 V, and capable of maintaining regulation down to 2-V output in CCM, the SRK1001 has a wide supply-voltage range of 4.5 V to 32 V. The output can sink up to 1 A and source up to 0.6 A to control the gate of the external n-channel synchronous-rectification MOSFET.

A dedicated Disable/Synchronization pin is provided to turn off the synchronous MOSFET and remotely trigger low-consumption mode, or to synchronize MOSFET turn-off during CCM operation. There is also a drain-voltage sensing input capable of monitoring the external MOSFET drain-source voltage up to 185 V.

The SRK1001 is in production now, packaged as an 8-pin SO8, from \$0.33 for orders of 1000 pieces. For further information, see the SRK1001 product [page](#).



(a)



(b)

Figure. Internal block diagram (a) and typical application diagram (b) for the SRK1001 secondary-side synchronous-rectification controller. The SRK1001 is designed for secondary-side synchronous rectification in flyback converters, suitable for operation in QR and mixed CCM/DCM fixed-frequency circuits.