PWM controllers boost efficiency in telecom, industrial power supplies

Texas Instruments today introduced two high-efficiency PWM power supply controllers with integrated, programmable-delay synchronous rectifier control outputs and pre-bias start-up circuitry. The UCC28250 and UCC28950 “green controllers” simplify design and boost efficiency in high-density isolated power supplies for telecommunications, server and industrial systems. The devices support multiple high-frequency topologies, such as half-bridge, full-bridge, interleaved forward and push-pull, that may have stringent pre-bias start-up requirements and support multiple high-efficiency topologies.

High-efficiency isolated DC/DC conversion

The UCC28250 is the industry’s first half bridge or full bridge PWM controller with the ability to maintain a monotonic output voltage ramp under pre-biased load conditions -- eliminating the need for external circuitry. It can support primary- or secondary-side control and delivers up to 95-percent efficiency and high power density in high-input voltage isolated DC/DC applications, such as power modules used in wireless base stations or industrial power systems. For samples and evaluation modules visit: www.ti.com/ucc28250-pr [1].

Other key features and benefits of UCC28250:

- Integrated synchronous rectifier outputs minimize conduction loss.
- One-percent accurate pulse-by-pulse current limit lowers system cost and simplifies design.
- Current mode and voltage mode control options provide flexibility.

Phase-shifted full-bridge control with synchronous rectification

TI also introduced the new UCC28950, which provides two additional PWM outputs for phase-shifted full bridge control up to 600 watts and achieves greater than 90-percent efficiency. The advanced controller integrates synchronous rectifier control and provides adaptive zero voltage switching over a wide input and output voltage range to reduce switching loss, which increases efficiency by 20 percent compared to competitive devices. The UCC28950 improves power supply performance in high-density power architectures for industrial, telecom and DC motor drives. For samples and evaluation modules visit: www.ti.com/ucc28950-pr [2].

Other key features and benefits of UCC28950:

- Allows designers to choose half-bridge with voltage mode or full-bridge with voltage/current mode for faster response.
- Light load management improves efficiency by 70 percent.
- 50- to 100-percent lower input and output ripple current allows the use of smaller input and output capacitors.

Easy-to-use models and selection tools

Both controllers are supported by various modeling and component selection tools to help speed power supply design, including PSpice® transient models, PSpice average models, MathCAD™ design tools, applications notes, evaluation modules and power supply reference designs.

Availability and pricing

The UCC28250 and UCC28950 are available in volume now from TI and its authorized distributors in a thermally enhanced 4-mm x 4-mm, 20-pin QFN or TSSOP package. Suggested resale pricing for the UCC28250 is $1.70 in 1,000-unit quantities and $4.25 for the UCC28950.

Find out more about TI's PWM controller [3] portfolio, application notes and evaluation modules:

- UCC28250 documentation and design tools:
  - Application note: Designing UCC28250 as a Secondary Side Control with a Pre-Bias Condition [4].
  - UCC28250EVM-564 [5] evaluation module for secondary side control.
  - UCC28250EVM-501 [6] evaluation module for primary side control.
- UCC28950 documentation and design tools:
  - Application note: UCC28950 600-W Phase Shifted Full Bridge Design Review [7].
  - TI Analog Applications Journal article: "Computing Power Going Platinum" [8]
  - UCC28950EVM-442 [9] evaluation module: 600-W phase-shifted full-bridge converter that converts a 370 V to 410-V DC input to a regulated 12-V output.
- Download the new Power Stage Designer™ [10] switch-mode power supply topology tool.
- Join the TI E2E™ Power Community to ask questions and help solve problems with fellow engineers: www.ti.com/powerforum-pr [11].

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http://www.ecnmag.com/products/2011/08/pwm-controllers-boost-efficiency-telecom-industrial-power-supplies

Links:

[1] http://www.ti.com/ucc28250-pr
[2] http://www.ti.com/ucc28950-pr
[3] http://focus.ti.com/paramsearch/docs/parametricsearch.tsp?family=analog&familyId=398&uiTemplateId=NODE_STRY_PGE_T
[4] http://focus.ti.com/general/docs/lit/getliterature.tsp?literatureNumber=slua560c&fileType=pdf
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