

Marvell 88EM8042

Single-Stage AC-DC LED Constant Voltage Controller



PRODUCT OVERVIEW

The Marvell® 88EM8042 chip is a high-performance single-stage AC/DC constant voltage flyback controller designed for offline power supply controllers. The Marvell 88EM8042 employs secondary side sensing for isolation and accurate current regulation. The IC supports universal input voltage.

Through Marvell's innovative mixed-signal technology, the Marvell 88EM8042 is able to deliver high efficiency, high power factor and low total harmonic distortion and good noise immunity. The high level of integration reduces system costs and the small package size saves board space.

The Marvell 88EM8042 uses Average Current Mode Control (ACMC) for Power Factor Correction (PFC) and the adaptive loop control achieves high power factor for a wide range of voltages and low load conditions. Working at a fixed frequency, the IC controls the application flyback circuit under Continuous Conduction Mode (CCM), Discontinuous Conduction Mode (DCM) or both combined together operating in mixed mode.

The Marvell 88EM8042 may be also used as the AC/DC stage in the design of a two-stage LED External Driver in conjunction with the Marvell 88EM8801, dual-string intelligent PWM Dimming DC/DC Buck LED driver. External two-stage LED driver reference designs that feature the Marvell 88EM8042 and Marvell 88EM8081 are available in 20-Watt and 40-Watt versions. Refer to the *Marvell External LED Driver Reference Designs Product Brief* for more details.

TARGET APPLICATIONS

The Marvell 88EM8042 is ideally suited for the following LED lighting applications:

- AC-DC off line power supply
- Universal input AC-DC adaptor
- First stage of two-stage external LED drivers

MARVELL 88EM8042 SYSTEM SCHEMATIC DIAGRAM

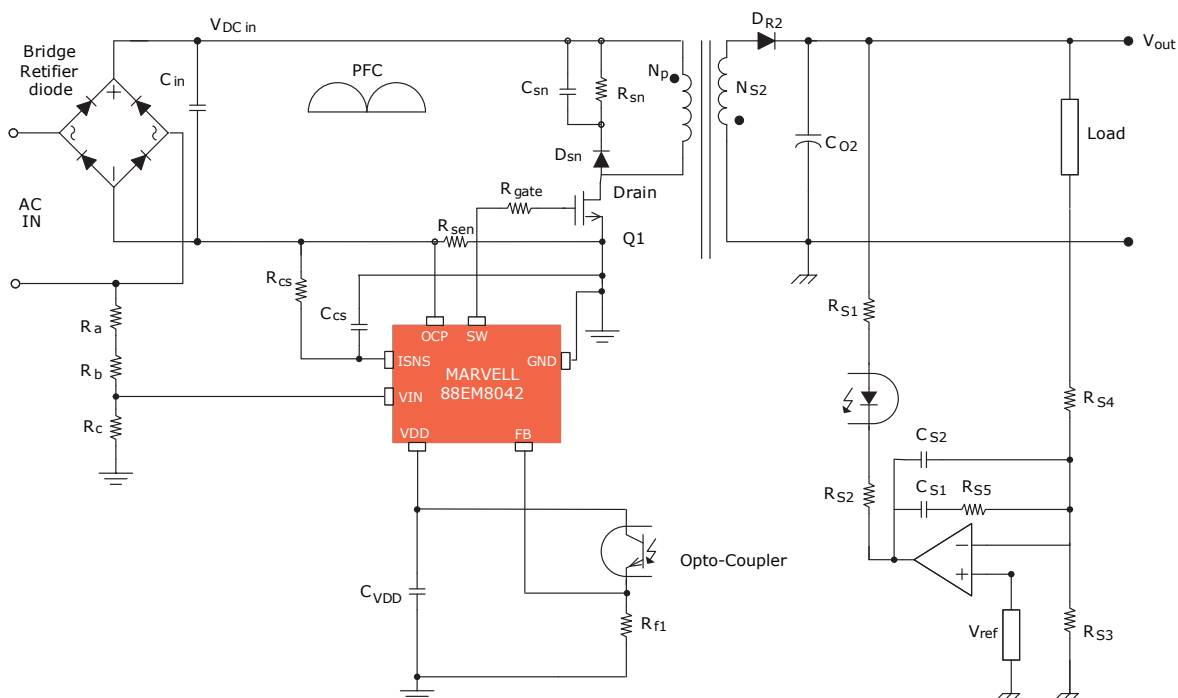


Fig 1. Marvell 88EM8042 AC-DC Power Factor Correction Flyback Controller Circuit Diagram

▶ FEATURES

- CCM, DCM and CCM/DCM mixed mode
- Average current mode control
- Adaptive control loop
- Cycle by cycle over-current protection
- Over voltage protection
- Under voltage lockout
- Thermal shutdown
- Input line frequency of 45Hz to 65Hz
- SOIC-8 package
- Operating temperature: -40 to 85°C (Tj max at 125°C)

▶ BENEFITS

- Performing PFC and output control in a single stage simplifies design
- Innovative mixed signal technology eliminates several external components reducing cost
- High efficiency - up to 90%
- High power factor - > 0.99
- Low THD - <20%
- Small package size saves board space

▶ MARVELL 88EM8042 DRIVER IC



Fig 2. IC - Front (enlarged)

▶ EVALUATION BOARDS

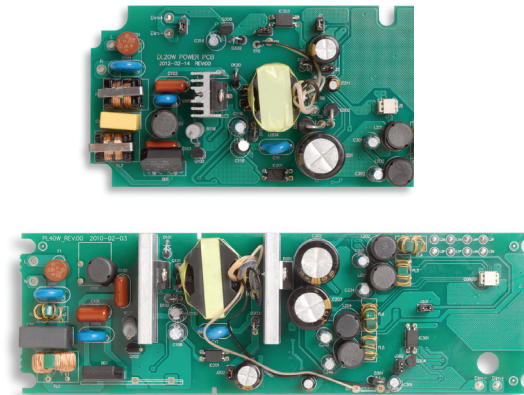


Fig 3. Marvell 20-Watt (top) and 40-Watt (bottom), Two-stage External Driver Evaluation Boards based on the Marvell 88EM8042

THE MARVELL ADVANTAGE: Marvell chipsets come with complete reference designs which include board layout designs, software, manufacturing diagnostic tools, documentation, and other items to assist customers with product evaluation and production. Marvell's worldwide field application engineers collaborate closely with end customers to develop and deliver new leading-edge products for quick time-to-market. Marvell utilizes world-leading semiconductor foundry and packaging services to reliably deliver high-volume and low-cost total solutions.

ABOUT MARVELL: Marvell is a leader in storage, communications, and consumer silicon solutions. Marvell's diverse product portfolio includes switching, transceiver, communications controller, processor, wireless, power management, and storage solutions that power the entire communications infrastructure, including enterprise, metro, home, storage, and digital entertainment solutions. For more information, visit our Web site at www.marvell.com.



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