



MP4029

Primary-Side-Controlled, Offline LED Driver with Fully-integrated Internal MOSFET

The Future of Analog IC Technology®

PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE

MPS CONFIDENTIAL AND PROPRIETARY INFORMATION – FUHUA USE ONLY

DESCRIPTION

The MP4029 is a primary-side-controlled offline LED lighting driver with an integrated 650V MOSFET. It can achieve high power factor and accurate LED current for isolated single-power-stage lighting applications in a single SOIC8-7B package. The proprietary real-current control method can control the secondary-side LED current using primary-side information. It can significantly simplify LED lighting system design by eliminating the secondary-side feedback components and the opto-coupler.

The MP4029 integrates power factor correction and works in boundary conduction mode to reduce the MOSFET switching losses.

The adaptive Transformer-Size-Reduction operation mode can achieve a smaller transformer AP value which can lead a smaller transformer size.

MP4029's multiple protection function greatly enhances the system reliability and safety. The MP4029 features over-voltage protection, short-circuit protection, primary side over current protection, brown out protection, over temperature protection, cycle-by-cycle current limit, V_{CC} under voltage lockout, and auto-restart function.

FEATURES

- Real current control without secondary-feedback circuit
- Adaptive Transformer-Size-Reduction Operation Mode
- Internal MOSFET with 650V High Voltage Rating
- Good line and load regulation
- High power factor ≥ 0.9 over universal input voltage
- Boundary conduction mode for improved efficiency
- Brown-Out Protection
- Over-Voltage Protection
- Short-circuit protection
- Primary side over current protection
- Over-temperature protection
- Input UVLO
- Cycle-by-cycle current limit
- Available in an SOIC8-7B package

APPLICATIONS

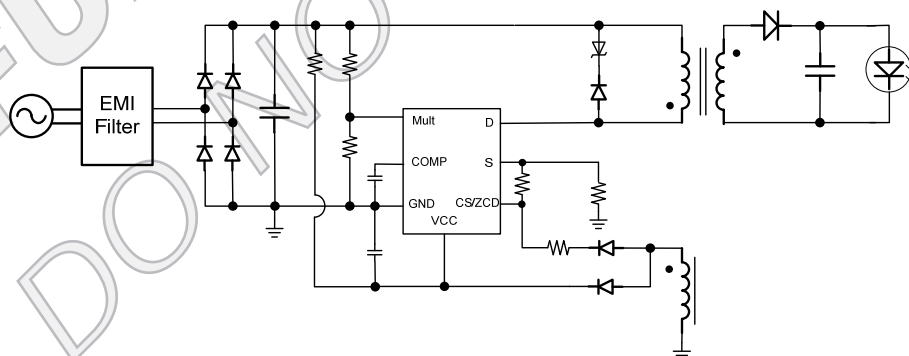
- Solid-state lighting
- Industrial and commercial lighting
- Residential lighting

All MPS parts are lead-free and adhere to the RoHS directive. For MPS green status, please visit MPS website under Products, Quality Assurance page.

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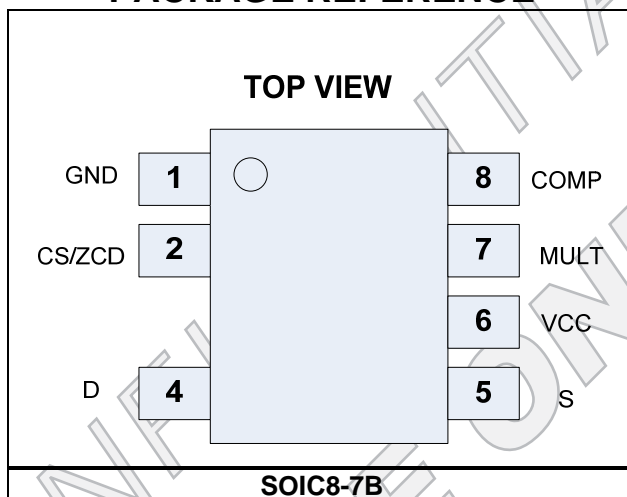
The MP4028 is under patent pending.

TYPICAL APPLICATION



ORDERING INFORMATION

PACKAGE REFERENCE



ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

Input Voltage V_{CC}	-0.3V to +30V
ZCD/CS Pin	-0.3V to +6.5V
Drain to Source Voltage	-0.3V to +650V
Continuous Drain Current	
MP4029-5	2A
MP4029-10	1.2A
Other Analog Inputs and Outputs ..	-0.3V to 6.5V
Continuous Power Dissipation ($T_A = +25^\circ\text{C}$) ⁽²⁾	
SOIC8-7B	1.3W
Junction Temperature	150°C
Lead Temperature	260°C
Storage Temperature	-65°C to +150°C

Recommended Operating Conditions ⁽³⁾

Supply Voltage V_{CC}	9.8V to 27V
Operating Junction Temp. (T_J) ..	-40°C to +125°C

Thermal Resistance ⁽⁴⁾

	θ_{JA}	θ_{JC}
SOIC8-7B	96	45 ... °C/W

Notes:

- 1) Exceeding these ratings may damage the device.
- 2) The maximum allowable power dissipation is a function of the maximum junction temperature $T_J(\text{MAX})$, the junction-to-ambient thermal resistance θ_{JA} , and the ambient temperature T_A . The maximum allowable continuous power dissipation at any ambient temperature is calculated by $P_D(\text{MAX}) = (T_J(\text{MAX}) - T_A) / \theta_{JA}$. Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.
- 3) The device is not guaranteed to function outside of its operation conditions.
- 4) Measured on JESD51-7 4-layer board.