



**THE DATASHEET OF  
MP6400DG-33-LF-Z**



### PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE

## DESCRIPTION

The HR1200 integrates a digital PFC controller and a half-bridge resonant controller into a single chip. It uses very low power at no-load or ultra-light load, making it compliant with Energy Using Product Directive (EuP) Lot 6 and Code of Conduct Version 5 Tier 2 specifications.

The PFC of the HR1200 employs a patented average current control scheme, which can operate in CCM and DCM multi-mode according to the instantaneous condition of the input voltage and output load. The IC exhibits excellent efficiency and high PF at light load. When operating in CCM, the controller can be used in applications up to 500W with minimal board size limitations. The performance of the PFC can be optimized by programming multiple parameters through an I<sup>2</sup>C GUI. Programming is completed either by the factory or by the customer using a detailed user guide.

The half-bridge LLC converter achieves high efficiency with zero-voltage switching (ZVS). The HR1200 implements an adaptive dead-time adjustment (ADTA) function, so the LLC converter can achieve easily ZVS from heavy load to light load. In addition, the HR1200 can prevent the LLC converter from operating in capacitive mode, making it more robust and easier to design.

The HR1200 integrates a high-voltage (HV) current source inside the IC for start-up, eliminating the traditional start-up resistor or external circuit. When the AC input is removed, the HV current source functions as an X-cap discharger, eliminating the need for a resistor for X-cap discharging. These features reduce the size of the BOM list and power consumption at no load.

Full protection features include thermal shutdown, over-current protection (OCP), over-voltage protection (OVP), and brown-in/brown-out protection.

## FEATURES

- Meets EuP Lot 6 and COC Version 5 Tier 2 Specifications
- HV Current Source for Start-Up
- Smart X-Cap Discharger when AC is Removed
- Standard I<sup>2</sup>C Interface
- 1K EEPROM to Store Parameters
- User-Friendly GUI for Digital PFC
- High Efficiency from Light Load to Full Load by CCM/DCM Multi-Mode Control
- High PF Due to Patented Input Capacitor Current Compensation
- Programmable Frequency Jittering
- Programmable Brown-In and Brown-Out
- Programmable Soft Start
- Cycle-by-Cycle Current Limit
- Open-Loop Protection
- LLC Controller
- 600V High-Side Gate Driver with Integrated Bootstrap Diode and High dV/dt Immunity
- Adaptive Dead-Time Adjustment of HB LLC with Minimum and Maximum Limit
- Burst Mode Switching
- Safe Start-Up in Case of Fault
- Two-Level Over-Current Protection (OCP)
- Latch Shutdown Protection
- Over-Temperature Protection (OTP)
- Capacitance Mode Protection

## APPLICATIONS

- Notebook Adapters
- All-in-One or Gaming Power Supply
- Desktop PC and ATX Power
- General AC/DC Power Supply up to 600W
- LCD TV and Plasma TV Power Supply

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**Please email**  
**[hr1200info@monolithicpower.com](mailto:hr1200info@monolithicpower.com)**  
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