

FEATURES

- Versatile Digital Voltage Mode Controller
- -40°C to +125°C Operating Temperature
- PMBus Revision 1.2 Compliant with PEC and Extended Manufacturer Specific Commands
- 6 PWM Control Signals with 312.5 ps Resolution
 - Programmable Switching Frequency from 48.8 kHz to 1 MHz
 - Multi-segments Soft-start of Duty and Switching Period for Open-loop LLC
 - Frequency Synchronization
 - Support HiZ Mode
- High-speed Voltage Sense
 - Independent 50 MHz 11-bit Tracking ADC for Input Voltage and Output Voltage Sense
 - Up to 1.6 V Differential Voltage Sense
 - Secondary-side Rectified Voltage Sense Capability for VFF
- High-speed Current Sense
 - 25 MHz Σ - Δ ADC for CS1 and CS2
 - Primary-side Cycle-by-cycle Fast over-current Protection
 - Secondary-side Cycle-by-cycle Fast over-current Protection
 - Secondary-side Diode Emulation Mode
- Advance control algorithm
 - Digital Control Loop with Programmable Loop Filters for CCM, DCM and Low-temperature
 - Duty-cycle Double Update
 - Fast Line Voltage Feed-forward
 - Pre-bias Startup
 - Synchronous Rectifier Control in DCM Condition
- Auxiliary functions
 - 25 MHz Σ - Δ ADC for TSNS, ADDR, VSET
 - Accurate Droop Current Sharing
 - IMON for Output Current Indicator
 - Compatible with NTC Temperature Sense

- Redundant Programmable OVP
- Extensive Fault Detection and Protection
- Up to 4 GPIOs
- Compatible with DOSA Analog Trim
- Programming via Easy-to-use Graphical User Interface (GUI)
- 512 bytes EEPROM for Programming and Data Storage
- Available at QFN4x4-24L Packages

APPLICATIONS

Intermediate Bus Converters (IBC)
Isolated DC/DC Power Supplies and Modules
Industrial 4.0 Power Applications

GENERAL DESCRIPTION

The **HP1000** is a versatile digital controller designed for high-density, high-efficiency DC-DC power conversion, with PMBus™ Revision 1.2 compliant interface. This device provides advanced power control solutions targeted at isolated and non-isolated DC-DC secondary-side applications, including full-bridge/half-bridge isolated converters, open-loop LLC converters, multi-phase buck converters, etc.

The **HP1000** offers extensive programmability of integrated digital compensators, fast input line feed-forward, PWM output types and timing, constant current mode, as well as soft-start/stop sequences and synchronization. Additionally, it provides flexible protection features including over-voltage protection (OVP), short-circuit protection (SCP), reverse current protection (RCP), over-temperature protection (OTP), and ensuring a robust power management solution.

The **HP1000** employs a flexible state machine architecture programmed via intuitive GUI. This user-friendly interface reduces design cycle time while producing a robust, hardware-coded system embedded in the built-in EEPROM.

The **HP1000** is available in 4 mm x 4 mm QFN-24L.