



Digital Totem Pole PFC Controller with I2C & UART Interfaces

Hynetek Semiconductor Co., Ltd.

HP1010

FEATURES

Highly flexible digital Totem Pole PFC controller

High flexibility digital PWM

- PWM frequency ranges from 20 kHz to 200 kHz
- PWM soft start during AC line zero-crossing
- Switching frequency spread spectrum for improved EMI

High performance control loop

- 25 MHz sigma-delta ADC for line voltage and current sense, 12.5 MHz sigma-delta ADC for output voltage
- Enhanced dynamic loop response
- Input voltage feedforward to avoid reverse current during AC drop
- Support HVDC input

Multi-mode operations

- Continuous Conduction Mode (CCM) in heavy load Conditions
- Discontinuous Conduction Mode (DCM) in light load conditions
- Burst mode in the zero load conditions

Advanced control functions

- True RMS power metering
- Inrush current control with programming relay delay
- Two channels X-cap discharge during shut down

Extensive fault protections

- Fast over-voltage protection
- Bulk under-voltage protection and over-voltage protection
- External NTC thermal protection
- Cycle-by-cycle current limit
- Average switching current protection
- Built-in 1 kBit MTP to store custom configurations

Low power consumption

I²C and UART interfaces

Programming via easy-to-use Graphical User Interface (GUI)

Available in QFN-24L packages

-40°C to 125°C operating temperature

APPLICATIONS

Ultra-High Efficiency Power Supplies

LED Lighting

Industrial Power Supplies

Server/Telecom

EV/E-Bike Charger

Supercomputing

Variable-Frequency Drivers (VFD)

GENERAL DESCRIPTION

The HP1010 is a highly flexible digital Power Factor Correction (PFC) controller designed to drive a totem pole PFC power stage.

Totem-pole PFC composes of a fast-leg using the third-generation semiconductor (GaN or SiC MOSFET) switching at PWM frequency and a slow-leg operating at the AC frequency. This design allows for a considerable increase in efficiency and power density by removing the diode bridge that is present at the input of a traditional PFC circuit.

The HP1010 offers RMS values of input voltage, current, and power. Through the I²C and UART interfaces, this information can be communicated to a microcontroller.

The HP1010 operates from a single 3.3 V supply. The device is available in 4 mm x 4 mm QFN-24L package specified over an ambient temperature range of -40°C to +125°C.

Device Information

PART NUMBER	PACKAGE	BODY SIZE
HP1010	QFN-24L	4 mm x 4 mm