

DSP-based PFC for Power Factors close to unity and an auxiliary low voltage DC power supply



The AMG-PS131 is a universal DSP-based PFC solution with switching-mode power supply, to be used in applications requiring power factor values close to unity and a highly efficient DC power supply. Typical application areas for the AMG-PS131 are high power motors and lighting systems. The power factor controller (PFC) is based on boost topology and is fully software controlled. The PFC algorithm is loaded into the DSP from an on-chip, non-volatile memory after Reset. The parameters of the algorithm can be changed using a two-wire interface (I²C compatible). The IC contains an auxiliary switching-mode power supply in flyback topology with current feedback. It is designed to supply external circuitry with a highly stable low voltage.

Highlights

- ❑ Independent DSP based PFC regulation engine
- ❑ PFC values >0.99
- ❑ Secondary SMPS controller for auxiliary low voltage generation

Example Application Circuit

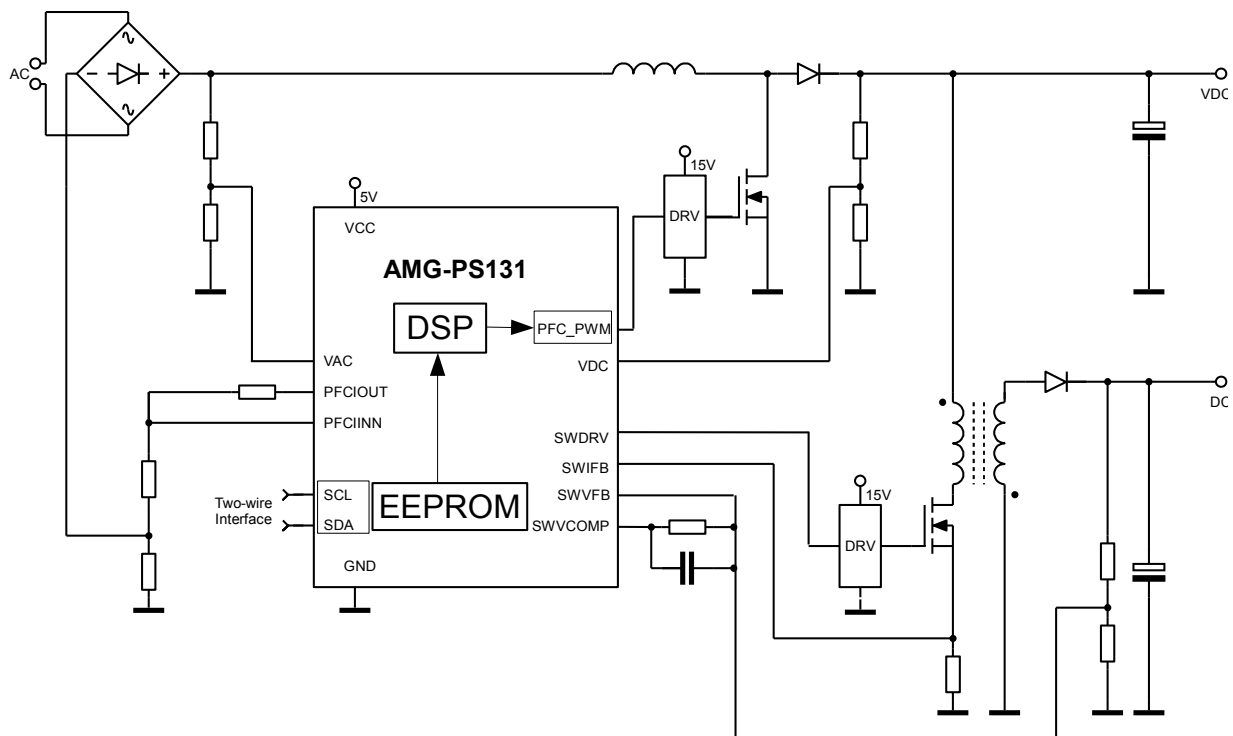


Figure 1: Simplified example application circuit.

Features

PFC

- Fully reconfigurable digitally controlled power factor controller in 0.25µm CMOS technology
- On-chip AC phase-locked sinusoidal 45Hz to 65Hz oscillator for mains noise rejection
- High accuracy through on-chip 10-bit ADC and dedicated RISC processor
- Achievable high efficiency (>95%) and power factor (>0.99)
- Broad range of user selectable PWM frequency (15kHz to 200kHz)
- Low EMC filter requirements due to use of spread-spectrum PWM
- Two-wire interface to load software
- Supports 90V to 275V; 50/60Hz mains standards
- On-chip PLL with 1% RC reference oscillator to generate 64MHz clock signal
- On-chip over-current and short-circuit protection, brown-out control
- Ambient temperature range: -25°C to 85°C
- Package: TQFP64 10x10 (smaller packages in evaluation)

Switching-mode Power Supply

- Current-mode switching power supply controller in CMOS technology
- Immediate response to low-frequency AC line swings
- Output voltage and current levels determined by external components only
- Energy saving cycle-skipping mode for operation with low levels of output power
- On-chip reference voltage source

Available options

- On-chip gate drivers
- On-chip OTP or EEPROM memory for stand alone operation of PFC
- User interface for extended control function

Ordering Information

- AMG-PS131-ITQ64T

Development Tools

- Application notes: AMG-AN-PS131
- Evaluation board
- GUI for easy parameter change