a3131 general features

The a3131 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 highly efficient DC power supply. Typical application areas for the a3131 are high-power DC motor controllers and lighting systems. The power factor controller (PFC) is based on the boost topology and is fully software-controlled. The PFC algorithm is loaded from an on-chip non-volatile memory for stand-alone operation or can be uploaded to the DSP core using a two-wire interface.
The switching-mode power supply controller (SMPSC) is based on the flyback topology with current feedback, and its role is to provide supply voltage(s) for any low-voltage electronics. Due to its immediate response, the current feedback topology makes the a3131 especially attractive for systems in which relatively high swings of the AC line voltage are expected.

Highlights:

PFC

- ❑ Fully reconfigurable digitally-controlled power factor controller in CMOS technology
- ❑ On-chip AC-phase-locked sinusoidal 45...65Hz oscillator to improve AC-line noise rejection
- ❑ High accuracy through on-chip 10bit ADC and dedicated RISC processor
- ❑ Achievable high efficiency (>95%) and power factor (>0.99)
- ❑ Broad range of user-selectable PWM frequency (5kHz...200kHz)
- ❑ Low EMC filter requirements due to use of spread-spectrum PWM
- ❑ Two-wire interface to load software
- ❑ Supports 90V...135V and 195V...275V 60/50Hz mains standards
- ❑ On-chip PLL with 1% RC reference oscillator to generate 64MHz clock signal

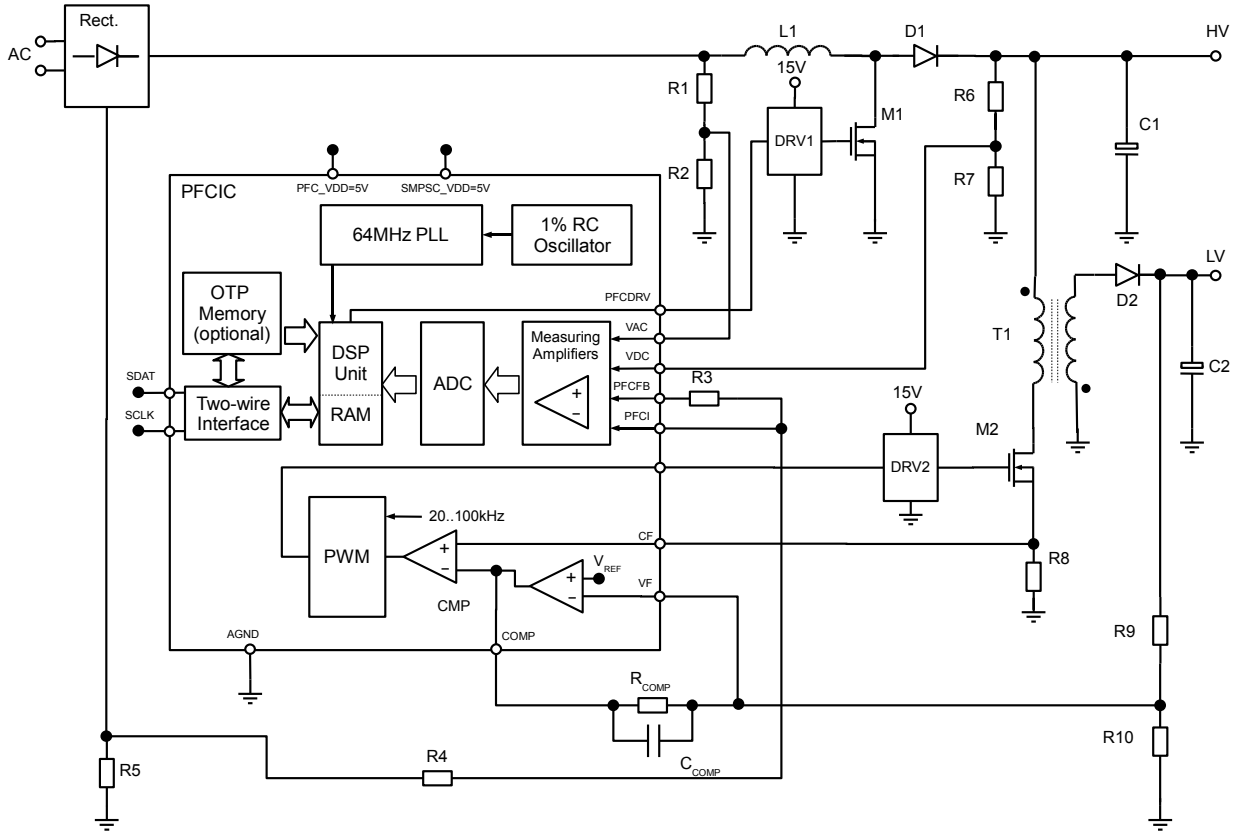
Switching-Mode Power Supply Controller

- ❑ 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 overcurrent and short-circuit protection
- ❑ On-chip reference voltage source

Available Options:

- ❑ On-chip gate drivers
- ❑ On-chip OTP memory for stand-alone operation of PFC

example application schematic



a3131 simplified application schematic (biasing details not shown)