

# Single-Phase Single-Stage AC-DC Converter with Reduced Line-Current Harmonics

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**Abstract.** The circuit for a single-phase single stage ac-dc converter with reduced line current harmonics is presented. It is basically a half-controlled ac-dc converter using two MOSFET transistors and two diodes. The transistors are used to provide alternative paths for the line current during periods when the smoothing capacitor is supplying the load current, thus reducing the line current harmonics. Extensive simulation results are presented and compared with the results obtained from a standard uncontrolled converter operating under similar conditions. Harmonics are reduced to levels compliant with those set out by the IEC61000-3-2 standard pertaining to class D equipment.