

#### General

Future lighting solutions need power factor correction (PFC) solutions. The form factor of energy saving lamps is a challenge, now mastered by PE. This application note shows how to introduce power factor solutions into lighting applications. A miniaturized PFC board for implementation into a standard socket of energy saving lamps (E27) using PEs PFC IC PE4201 is described.

#### Features (PE4201)

- Low total harmonic distortion (THD)
- Low start-up current (<5 $\mu$ A)
- Low operating current (<450 $\mu$ A)
- Disable function (<170 $\mu$ A)
- Under-voltage lockout with >8V hysteresis
- Over voltage and over current protection with separate reference
- Reduced operating frequency if output power low
- High efficiency at high and low output power
- Internal clamping resistor
- Fast driver switch 'off'
- Very fast driver 'off' at over current sense
- Driver load up to 5nF

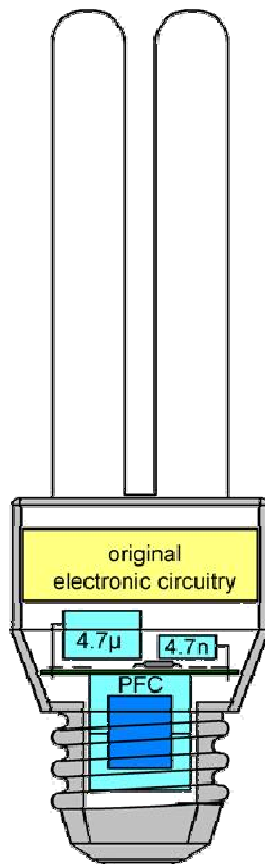


Figure 1: application example PFC board for E27 energy saving lamp

#### Technical Data

Input voltage .....	110V/230V (50/60Hz) AC
Output voltage .....	340- 400V DC (adjustable)
Max. output .....	25 W with PE4201
Efficiency .....	>90 %
Power factor .....	0.90 to 0.98 (depend on power out)
Board dimension .....	diameter 29mm, height 15mm (assuming usage of existing electrolyte capacitor of the original lamp supply circuitry)

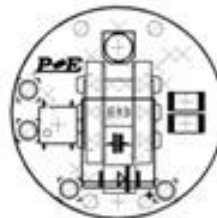


Figure 2: original dimension E27 PFC board



# AN PFC ESL 25W

Reference Design

PFC for Energy Saving Lamp Sockets

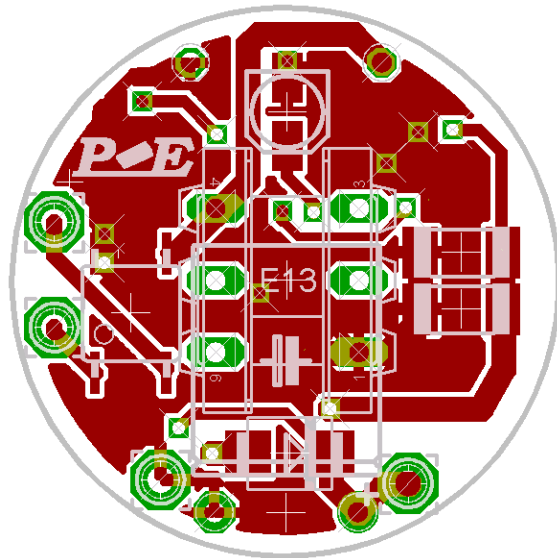


Figure 4: PFC board top side  
(diameter 29mm, height~15mm)

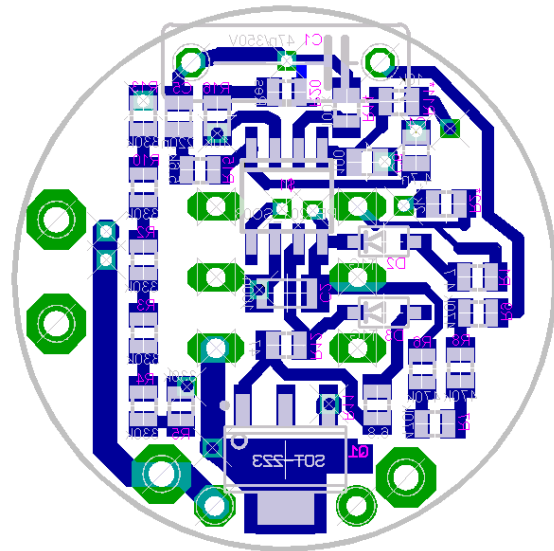


Figure 5: PFC board bottom side

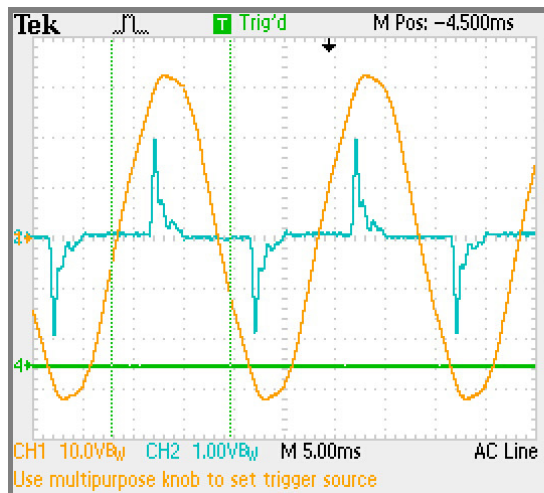


Figure 6: energy saving lamp without PFC

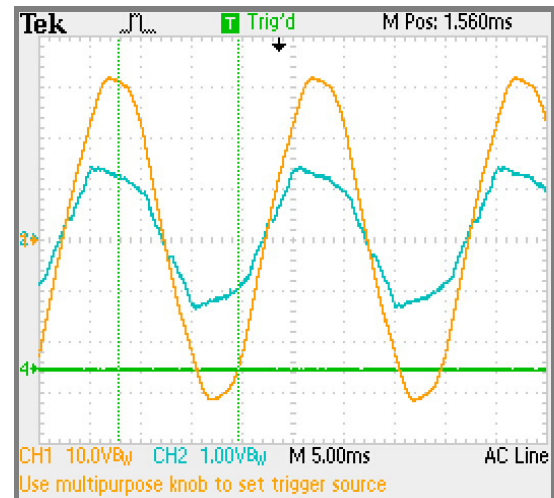


Figure 7: energy saving lamp with PFC

Remarks:

- For detailed IC description, Eagle layout data base and BOM calculation please visit our web site

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