AN PFC ESL 25W

Reference Design

PFC for Energy Saving Lamp Sockets

SERMA PRODUCTIVITY ENGINEERING

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 (<5µA)
- Low operating current (<450µA)
- Disable function (<170µA)
- 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

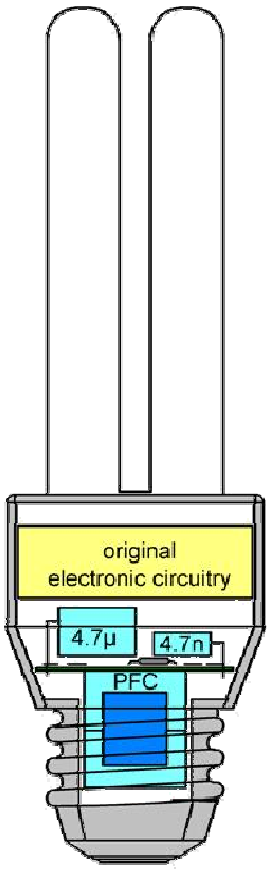

Figure 1: application example PFC board for E27 energy saving lamp

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)

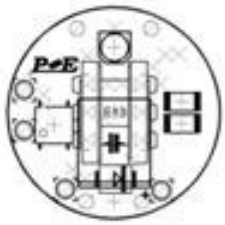

Figure 2: original dimension E27 PFC board

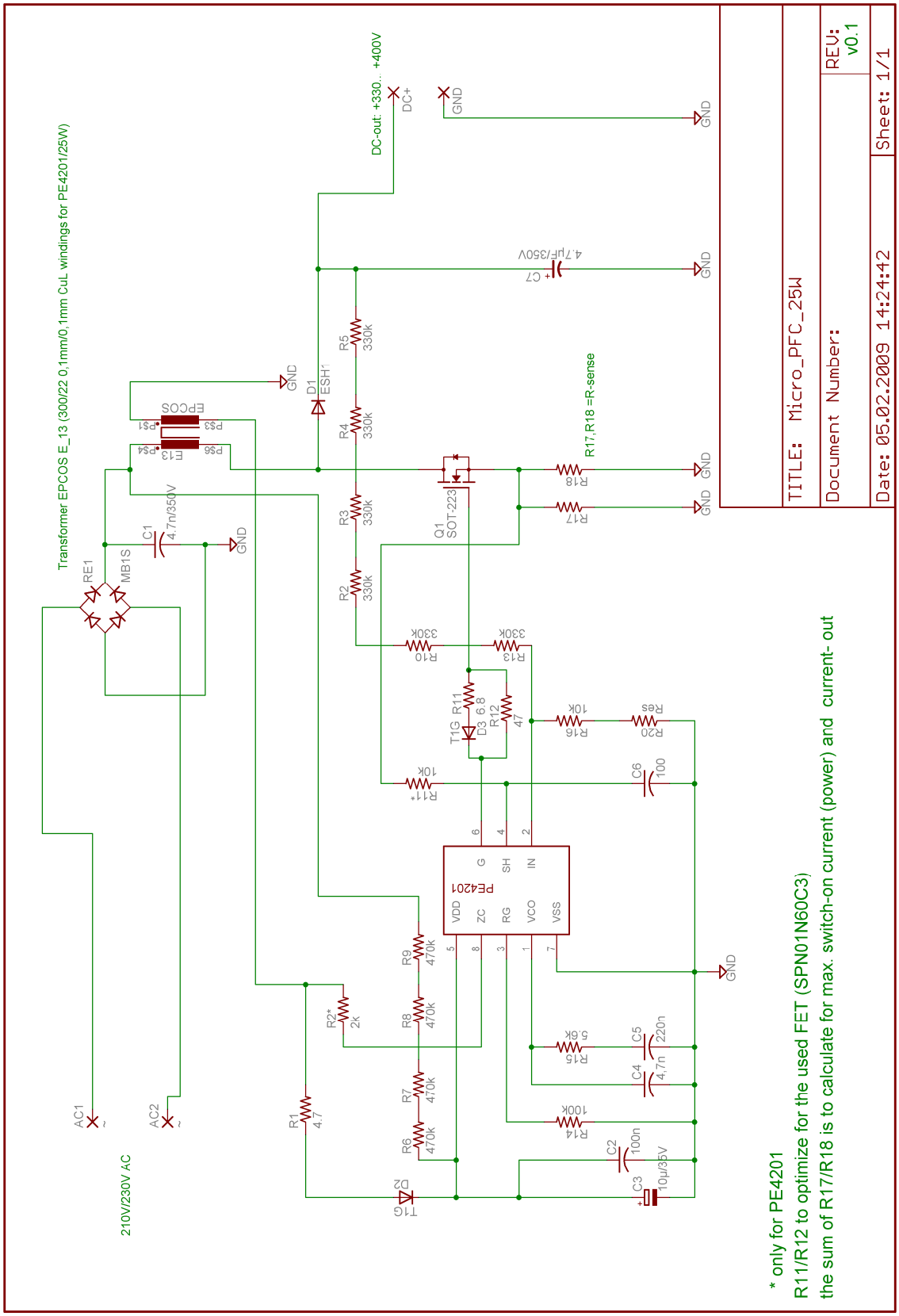

Figure 3: circuit diagram

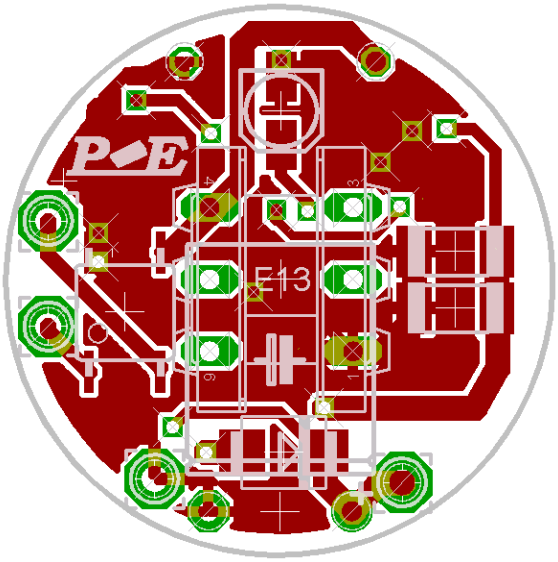

Figure 4: PFC board top side
(diameter 29mm, height~15mm)

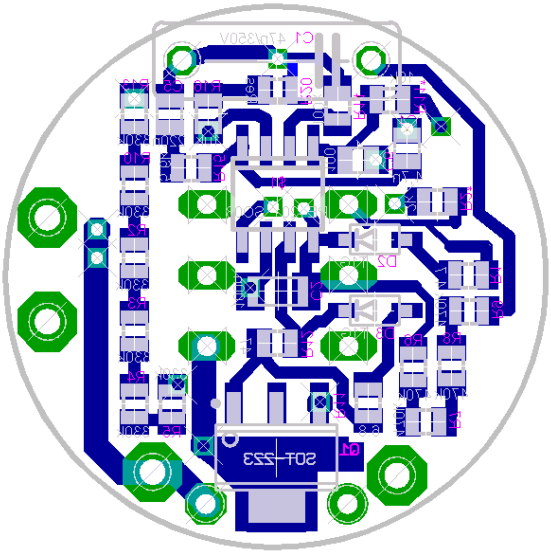

Figure 5: PFC board bottom side

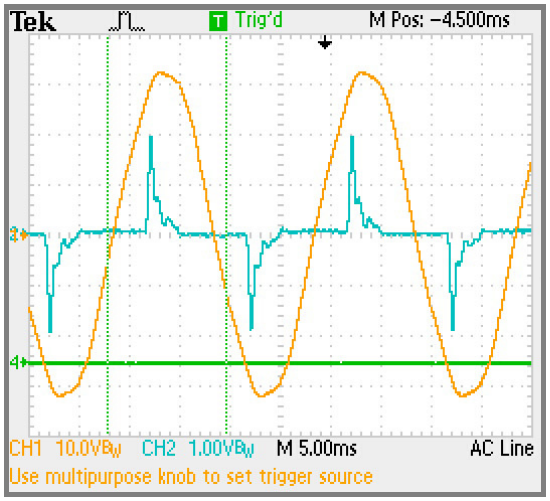

Figure 6: energy saving lamp without PFC

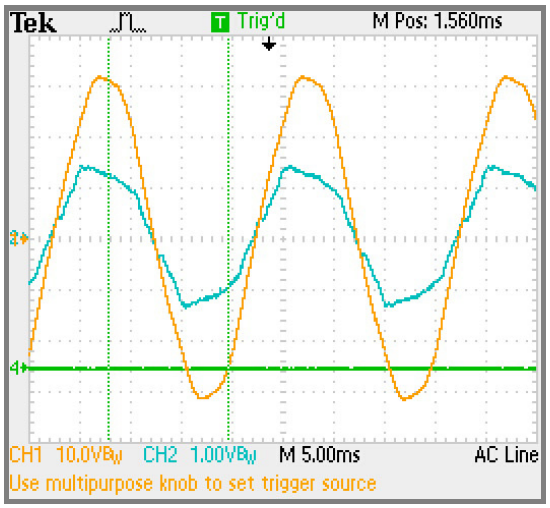

Figure 7: energy saving lamp with PFC

Remarks:

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

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