

3kW Totem-pole PFC & LLC power supply

Description

This reference design is a high density 3kW power supply solution. It is using totem-pole PFC topology that removes bridge diodes which create a high-performance PFC front end. The DCDC stage is using a secondary side LLC controller which embedded the synchronous rectification in one single chip. In order to work under high switching frequency. This design has used Silicon Carbide (SiC) MOSFET in PFC and LLC stage. Resulting high efficiency, high power density and extremely good performance.



Advantages

- High efficiency
- High power density
- Wide operation range
- Pure analog control
- No firmware development required
- Good thermal performance

Features

- Input voltage range: 85-264Vac
- Output: 48Vdc 62.5A Max.
- Output Power: 3000W Max.
- PF: >0.98
- Efficiency: >96%
- PCBA Dimension: 300x180x67mm

Core Chip

- Totem-Pole PFC controller: **onsemi** NCP1681
- Secondary side LLC controller: **onsemi** NCP4390
- Gate driver: **onsemi** FAN7191, NCP51561, NCP81705
- SiC MOSFET: **onsemi** NTB045N065SC1
- MOSFET: **onsemi** NVB055N60S5F, NTBLS1D1N08H
- Custom made magnetics: **Bourns** B181101, B181103

Applications

- Server power / Industrial power supply / Charger for robotics / High power battery charger

Block Diagram

