# 3kw inverter design

What are the specifications of a 3 kW PV inverter?
The input voltage and MPPT range are the most typical values for a 3 kW PV inverter. Other specifications like ac voltage/frequency range, power factor and THD are the mandatory requirements of certification standards. Fig. 2 shows the topology of the power stage of the 3 kW ZVS PV inverter.

What is cm filter in a 3KW commercial PV inverter?
The CM filter is modified from the design of a 3kW commercial PV inverter with H6 topology. Even though the H6 topology has constant dc CM voltage,CM filters are still needed to suppress to leakage current caused by the switching transient and fulfill the EMI requirement.

Which resonant circuit is used in a 3KW residential PV inverter?
The ZVS-PWM technologyis used in this 3kW residential PV inverter. As shown in Fig. 2,the ZVS-PWM technology requires additional resonant circuit including the resonant inductor Lr,resonant capacitor Cr,clamping capacitor Cc and active-clamping switch Sa.

What is the weighted CEC efficiency of a 3KW PV inverter?
The weighted CEC efficiency is calculated as 98%. The efficiency of a 3kW commercial H6 PV inverter mentioned in Section III is also measured with the same operation voltages,which is lower than the ZVS PV inverter due to higher switching loss and magnetic loss.

How is the ZVS PV inverter made?
The chassis is made by 3D printerfor fast prototyping. Due to the smaller size and light weight,the boost inductors and the DM inductors can be assembled on the PCB with the power stage. Fig. 12. Common mode model of the ZVS PV inverter for leakage current analysis. Fig. 13. Schematic of the output CM filter design. Fig. 14.

How efficient is a ZVS PV inverter?
The estimated overall efficiency of the ZVS PV inverter is 98.6%with 1.5 kW and 98.3% with 3 kW. The conduction loss of MOSFETs is the largest part of the total loss.

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