

## **Double-series resonant inverter-fed voltage multiplier based high-voltage DC-DC converter**

### **Abstract**

This article presents a novel series resonant inverter-fed high-voltage DC-DC converter. The proposed converter consists of two resonant tanks that are energized by a half-bridge inverter. Two high-voltage transformers are utilized, with their individual secondary winding connected to a voltage multiplier so that the output voltage is rectified and boosted. The outputs of the voltage multipliers are connected in series to supply the load. The proposed converter operates in discontinuous conduction mode. A dual-mode pulse-frequency modulation control strategy is implemented to regulate the output voltage and to achieve fast transient response during startup of the converter. All power switches turn ON and OFF under zero current switching condition. The main features of the proposed converter are lower conduction loss, lower switching loss, and, consequently, higher efficiency compared to the conventional full-bridge inverter-fed high-voltage DC-DC converter. The proposed converter also has faster transient response during startup. Experimental results of a 100-W prototype confirm the excellent operation and performance of the converter.

### **Keywords**

Double-series resonant; High-voltage DC-DC converter; Pulse-frequency modulation; Zero current switching