

A resonant switched-capacitor converter (SCC) has been analyzed above its resonant frequency to realize zero-voltage switching (ZVS) and to overcome voltage regulation issue of SCCs even when wide input voltage and output power variations are applied. ZVS operation under the continuous conduction mode (CCM) conditions improves efficiency due to lower conduction and switching losses. It is more efficient than the widely used zero-current switching (ZCS) approach in recent years under the discontinuous conduction mode (DCM) condition. Because, switching losses dominant components are reduced in MOSFET-based converters under the ZVS not ZCS conditions. Also, it has been demonstrated that output voltage can be well regulated under the CCM operation when wide input voltage and load variations are used. When output voltage regulation is not the major issue, operating at fixed switching frequency higher than, but near to, the resonant frequency results smaller components, higher power density, and lower electromagnetic interference level, as compared to the constant voltage ratio DCM operation mode, widely used in recent years. Also, output voltage ripple has been calculated, in details, by considering parasitic components of the output capacitor. A 110-165 to 200 V SCC has been implemented in 206.6-402.5 kHz frequency range to deliver 100-500 W. Maximum and average efficiency values equal to 96.8% and 94% are achieved, respectively.