

## ABSTRACT

This paper proposes a current-fed non-isolated soft-switching bidirectional dc/dc converter for interfacing energy storage to DC micro-grid. The proposed converter employs a current-fed half-bridge boost converter at front-end followed by an LCL resonant circuit to aid in soft-switching of semiconductor devices. A voltage doubler at output is selected to enhance the gain by 2x. The LCL resonant circuit also adds a suitable voltage gain. Therefore, the topology offers overall high voltage gain without transformer or large number of multiplier circuits. For buck operation, high side voltage is first divided by half with capacitor divider to gain higher step-down ratio. Converter operates at high switching frequency to realize merits of reduced magnetics and filters. Zero voltage turn-on is achieved for all switches and zero current turn-on and turn-off is achieved for all diodes for both buck/boost operation. Voltage across switches and diode is clamped naturally without any external Snubber circuit. Detailed analysis and design have been proposed.