SNUBBERLESS Z- NETWORK BASED DUAL MODE CONVERTER FOR HYBRID GRID

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Abstract:

A snubberless Z-source bidirectional converter which is isolated by dual mode DC–DC converter The converter which bridge the hybrid grid as an application A distinct dual mode DC–DC converter with full bridge inverter to serve Ac grid and regardless of full bridge inverter DC grid can be put in place made it smarter. During forward operation high boost increased voltage ratio is attained and more voltage is bucked during reverse mode. Because of secondary modulation voltage is being clamped and the property is possessed naturally. Soft switching leads the converter stand without snubber circuit by current zero commutation of current-fed devices and natural clamping of devices' voltage is achieved. ZCS of primary components and the transformer's secondary components are subjected to ZVS and the same is achieved so as to possess the soft switching capability. On account of inherent nature achieved by soft switching; input voltage variation is wide and it is maintained for entire operation. Because of the soft switching capability load independency is achieved which is really suited for different loads also load independent is really suited for the modern smart micro grid application. Dual mode operation is suitable for the future smart micro grid application since either mode from source to load and load to source is needed for smart metering as well. Forward and Reverse mode steady state operation, analysis, and design are obtained.

Keywords: **Photovoltaic(PV); Hybrid grid; ZVS;ZCS.**

I. INTRODUCTION

A DC- DC bidirectional dual mode converter is operatedin two operatingquadrants. The features of minimizing the cost and Saving volume, weight, has been widely spread the usage of this dual mode converter in applications such as charging and discharging of batteries, different DC motor solid state drive systems, smart grid applications, modern hybrid renewable based electric vehicle, online and offline uninterrupted power supplies(UPSs), and auxiliary power supplies for future hybrid AC and DC grid where the function of two-way power flow is needed. Generally, BDC is Segregated into two classification viz; Insulated and non-insulated.Further more isolated dual mode converter plays a vital factor in isolating the primary and secondary for preventing the equipment from the damage particularly in military and other critical application. Advancement in smart technologies lead the power generation in rapid pace in smartness through smart grid.Solar powergeneration is increased as depletion of natural resources is increased rapid pace and green environmental concerned. From 2004 to 2010, the PV capacity is increasing at the rate of 60% annually and it is keep on growing in a rapid manner and it is being increased worldwide and is expected to satisfy 10% of world energy consumption by 2020.

1) Asymmetric control modes that makes more difficult the selection of a fixed snubber network.2) Output power is minimally influenced by small deviations in maximum power point tracking (MPPT) voltage. 3) Output voltage is weakly sensitive to the variation of load. As a result, Photo voltaic modules which are connected in cascademode are possessing the ability to reach maximum power nearly under different range of illumination obtained by wide band range of luminous flux which is the cause of different illumination condition. The front-end dc/dc converter converts variable solar panel dc voltage into regulated and useful form. Various front-end converter topologies and inverter schemes are proposed in different literature.

A non – isolatedconverter plays vital strategy in high step up range which is used for a grid-connected inverter. This high step up DC-DC is presented for an inverter which is grid connected including the analysis of multilevel converters, cascaded boost converters, switched capacitor converters, boost converters integrated with a coupled inductor to achieve high step-up conversion, combination of coupled inductor, and switched-capacitor etc. The parasitic nature of the devices and reverse recovery time of the diode are the main problem in this case and made this as important constraints for these converters, which limit voltage gain and the efficiency.The isolated DC-DC converter with various high frequency transformer have been researched and proposed for such particular application and when Compared with voltage-fed isolated converters, current-fed converters are demonstrated and justified for lower input voltage with wide variations (PV, fuel cell). Different circuit topologies have been researched such as full-bridge, half-bridge, and fly back and push-pull topologies.