

A SWITCHED CAPACITOR BASED MULTILEVEL INVERTER TOPOLOGY WITH REDUCED COMPONENTS

Gowtham Balaji R , Dinesh S, Giridharan A
R.M.K. College of Engineering and Technology

Multilevel inverter has emerged recently as a very important alternative in the area of high-power medium voltage energy control. This thesis presents the most important topologies like diode clamped inverter (neutral point clamped), capacitor clamped (flying capacitor) and cascaded multi cell with separated DC sources. This thesis also presents the most relevant control and modulation methods developed for this family of converters; multi-level sinusoidal pulse width modulation, multi-level selective harmonic elimination and space vector modulation. Special attention is dedicated to the latest and more relevant applications of these converters such as laminators, conveyer belts and unified power flow controllers. The need of an active front-end at the input side for those inverters supplying regenerative load is also discussed and circuit topology options are also presented. The nine-level inverter was designed and results were also shown in the thesis. Finally the peripherally developing areas such as high voltage high power devices and optical senses and other opportunities for future development are addressed.

