



Proposed System

Fig. shows the proposed SC nine-level inverter topology. The proposed inverter consists of a single DC source, two SC cells connected in parallel with the H-bridge circuit and a load. The first SC cell is a combination of one capacitor, one diode, and two switches (C_1 - D - S_{11} - S_{12}), and the second SC cell includes one capacitor, and three switches (C_2 - S_{21} - S_{22} - S_{23}).

Working

- Capacitor C_1 is charged while connected in parallel with the input source through S_{12} .
- It is discharged in series with the input source through S_{11} .
- Capacitor C_2 is charged in parallel from the input source and capacitor C_1 through S_{22} and S_{23} .
- It is discharged in series with capacitor C_1 and the input source through S_{21} .
- C_1 is thus charged to V_{in} and C_2 is charged to $2V_{in}$.

Four Levels of voltage (in addition to a zero level) are therefore obtained by the following combinations:-

- V_{in} – Source and C_1 in parallel.
- $2V_{in}$ – Source and C_1 in series which is then parallel with C_2 .
- $3V_{in}$ – Source and C_1 in parallel which is then series with C_2 .
- $4V_{in}$ – Source, C_1 and C_2 all in series.

These four levels of voltage can be reversed in polarity at the output by the H-Bridge. Therefore there are 9 different voltage levels ($4*2 + 1$) available at the output of the inverter. The switching states are controlled by Phase disposition PWM (PD-PWM).