

Single Pulse Width Modulation Technique



Consider the full-bridge single-phase inverter with input voltage equal to 400V. This inverter is controlled by single PWM technique. The aim is to generate a 3-level half-wave symmetry waveform at the output. The output frequency is considered 50Hz. The amplitude modulation index is 0.5. The load is assumed as R - L with values 2 Ohm and 0.01H, respectively.

Implement this inverter in PSCAD software with details.

Sinusoidal PWM

Consider the full-bridge single-phase inverter with input voltage equal to 400V. This inverter is controlled by SPWM technique. The aim is to generate a 3-level half-wave symmetry waveform with 6 pulses in each half-cycle. The output frequency is considered 50Hz. The amplitude modulation index is 0.7. The load is assumed as R - L with values 2 Ohm and 0.01H, respectively.

Implement this inverter in PSCAD software with details.

Single-Phase ac/ac Matrix Converter

Example

Consider the single-phase ac/ac matrix converter with input voltage equal to

$$v_i = 200 \sin 100\pi t$$

This converter is controlled by positive control method with switching frequency equal to 500Hz to generate the following fundament component at the output:

$$v_o = 80 \sin 200\pi t$$

- Draw its power circuit.
- By applying the positive control method for this converter, calculate the values of time intervals $t_{1,p}$ and $t_{2,p}$ for all times.
- Design the trigger signals of switches.
- Draw the generated output voltage and its fundamental component.

Consider the full-bridge three-phase Z-Source inverter with input voltage equal to 400V. This inverter is controlled by SPWM Single boost technique. The output frequency is considered 50Hz. The amplitude modulation index is 0.9. The load is assumed as R - L with values 2 Ohm and 0.01H, respectively.

Implement this inverter in PSCAD software with details.