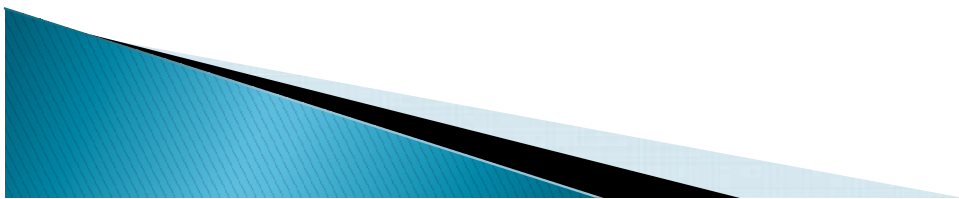


# Commutation Circuits



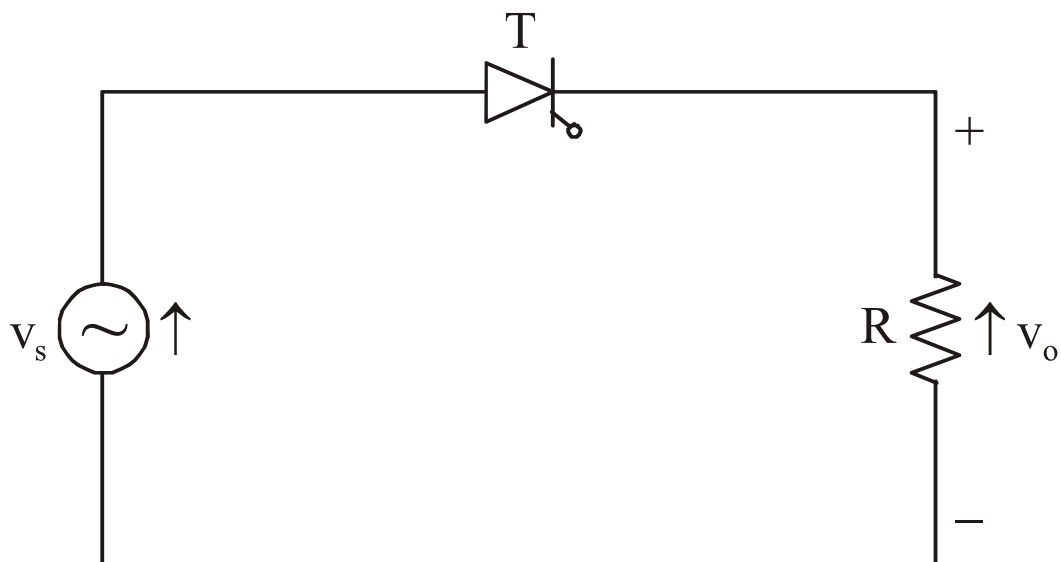
# Introduction

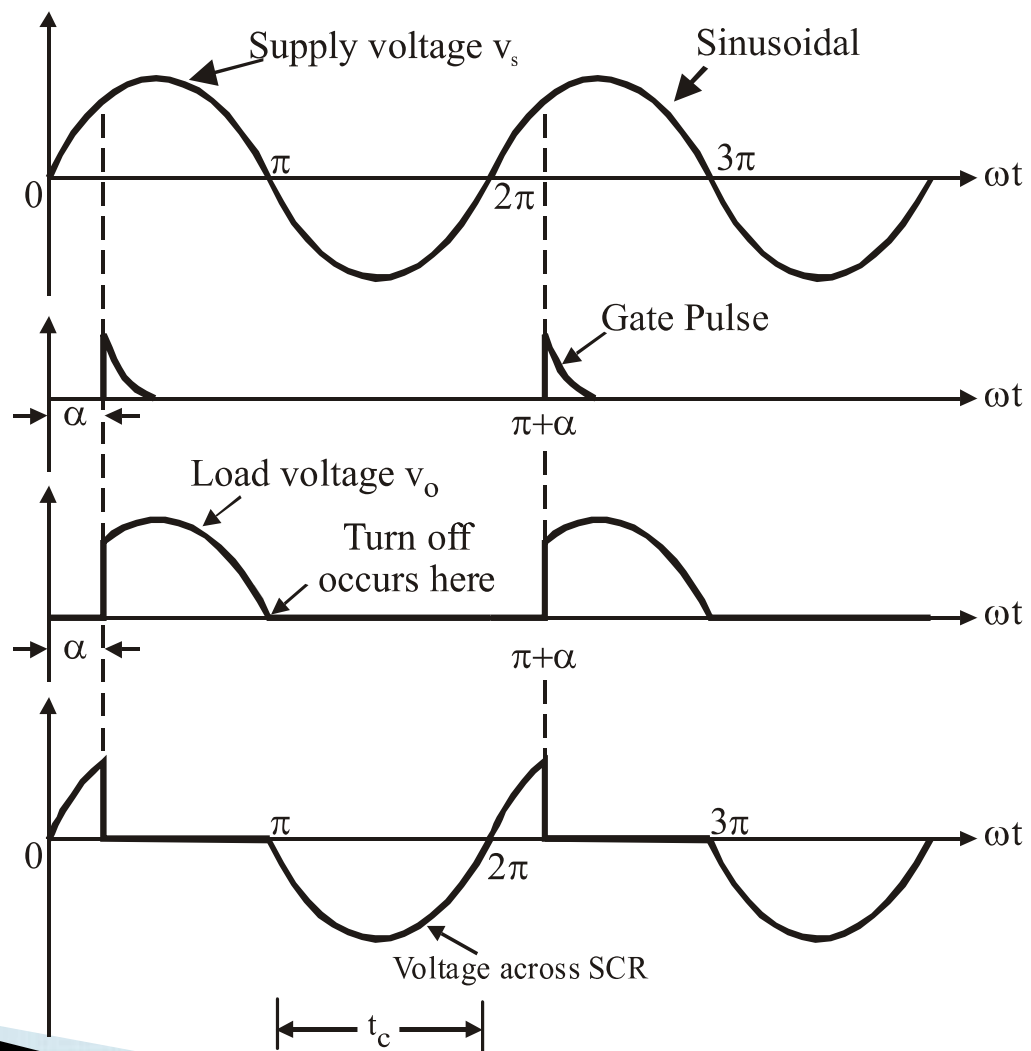
- ❑ **Commutation Process of turning off a conducting thyristor.**
- ❑ **Current Commutation**
- ❑ **Voltage Commutation**

## Methods of Commutation

- Natural Commutation
- Forced Commutation

## Natural Commutation





- ▶ Natural Commutation of Thyristors takes place in
  - AC voltage controllers.
  - Phase controlled rectifiers.
  - Cyclo converters.

## Forced Commutation

- ▶ Applied to dc circuits
- ▶ Commutation achieved by reverse biasing the SCR or by reducing the SCR current below holding current value.
- ▶ Commutating elements such as inductance and capacitance are used for commutation purpose.

## Methods of Forced Commutation

- Self commutation.
- Resonant pulse commutation.
- Complementary commutation.
- Impulse commutation.
- External pulse commutation.
- Load Commutation.
- Line Commutation.

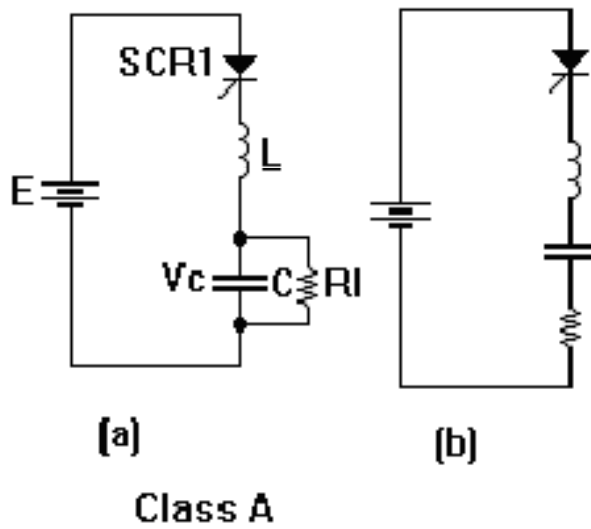


## Forced Commutation is applied to

- ▶ Choppers.
- ▶ Inverters.

**Self Commutation  
Or  
Load Commutation  
Or  
Class A Commutation  
(Commutation By Resonating The Load)**

- ▶ Circuit is underdamped by including suitable values of  $L$  &  $C$  in series with load.
- ▶ Oscillating current flows.
- ▶ SCR is turned off when current is zero.



## Class B Commutation Or Resonant Pulse Commutation or Current Commutation

- ▶ Series LC circuit connected across thyristor 'T'.
- ▶ Initially 'C' is charged to 'V' volts with upper plate as positive.
- ▶ Current in LC oscillates when SCR is ON.
- ▶ 'T' turns off when capacitor discharges through thyristor in a direction opposite to  $I_L$ .

