# SNS COLLEGE OF TECHNOLOGY

**Coimbatore-35**
**An Autonomous Institution**

*Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade*
*Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai*

## DEPARTMENT OF MECHATRONICS

## 16MC302 – INDUSTRIAL ELECTRONCIS & APPLICATION

*III YEAR V SEM*

## *UNIT 1 – INTRODUCTION TO POWER ELECTRONICS*

## *TOPIC* – SCR

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## Revision

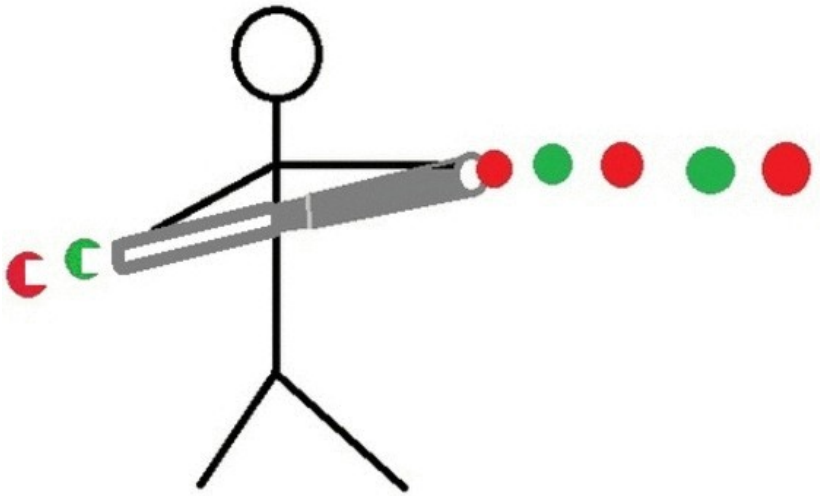
**Differentiate Power Electronics Switch and Solid state swith.**

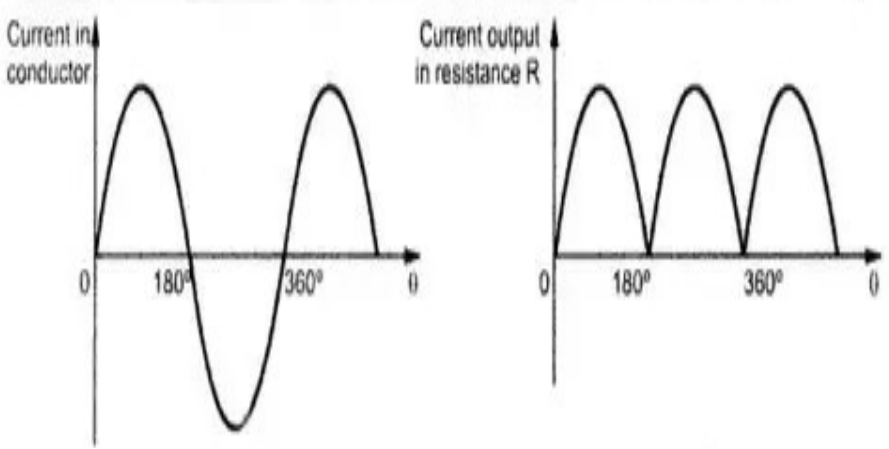
**Why Power Electronics Switch?**

**4 Type of Conversion process.**

## SCR

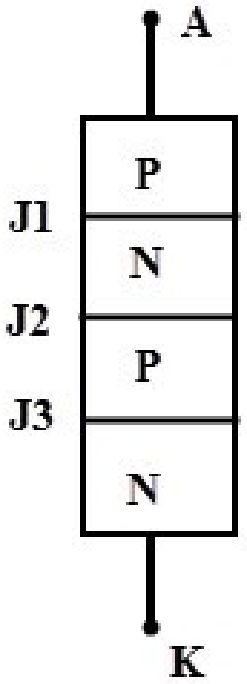
The Silicon Controlled Rectifier (SCR) is the most important and mostly used member of the thyristor family. SCR can be used for different applications like rectification, regulation of power and inversion, etc. Like a diode, SCR is a unidirectional device that allows the current in one direction and opposes in another direction.

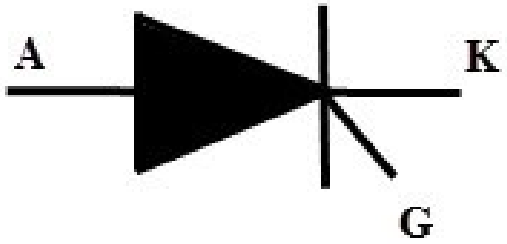


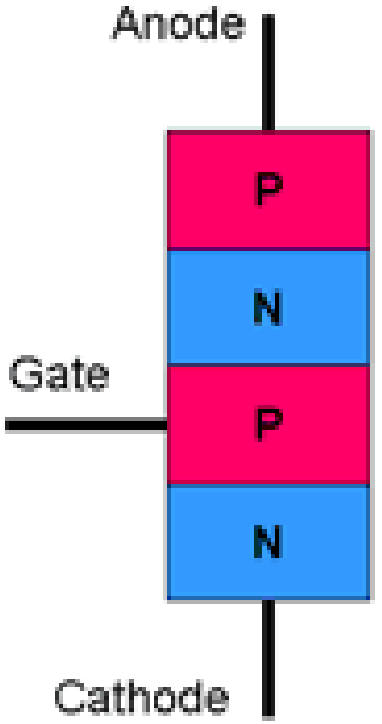



Intha Waveform Direction ah intha side maathuthu...
Full-wave signal
Ithuku per AC-DC Converter ah...?

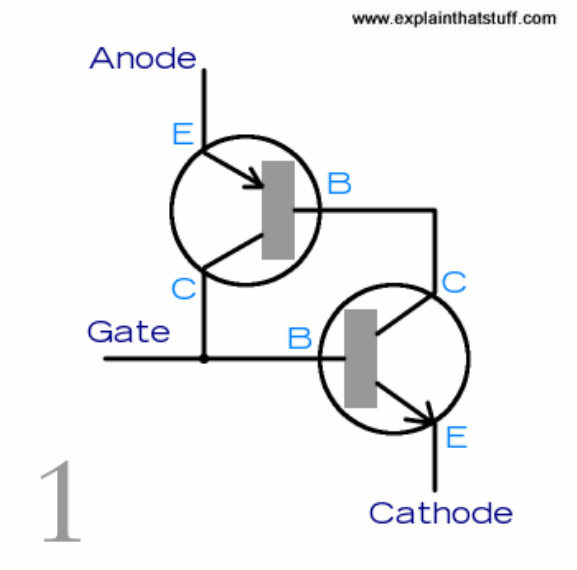
## SYMBOL

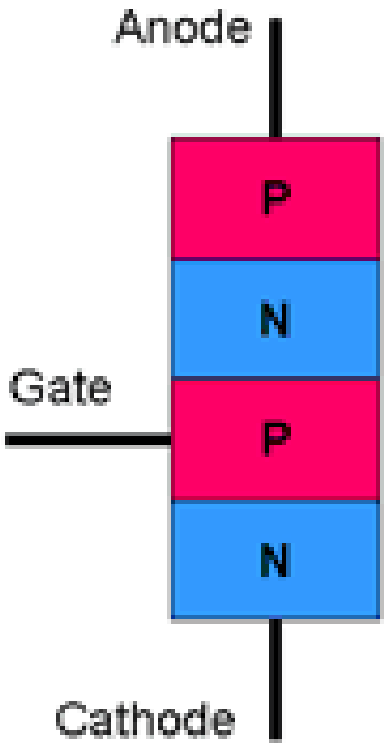


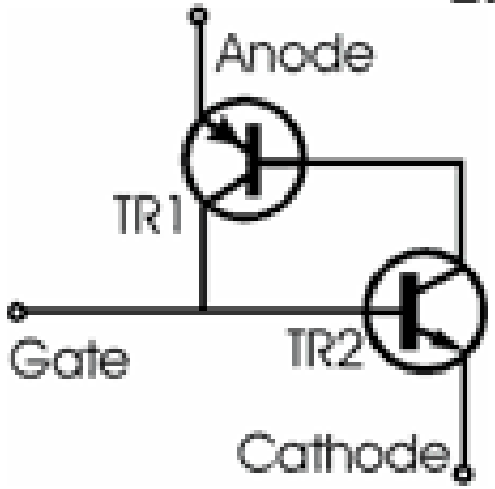



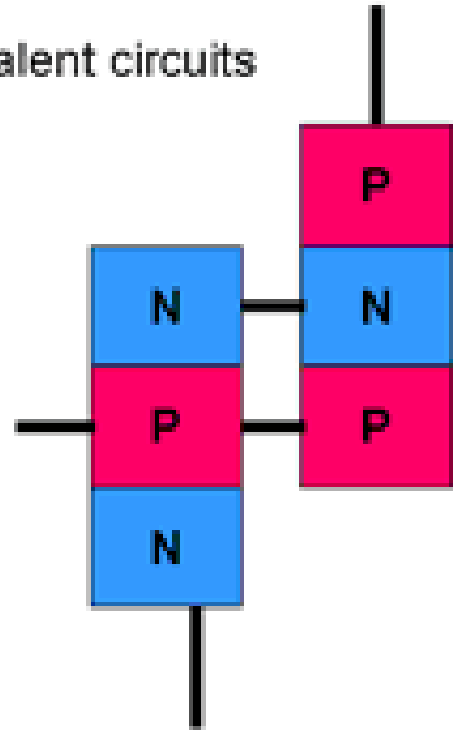



## LAYER



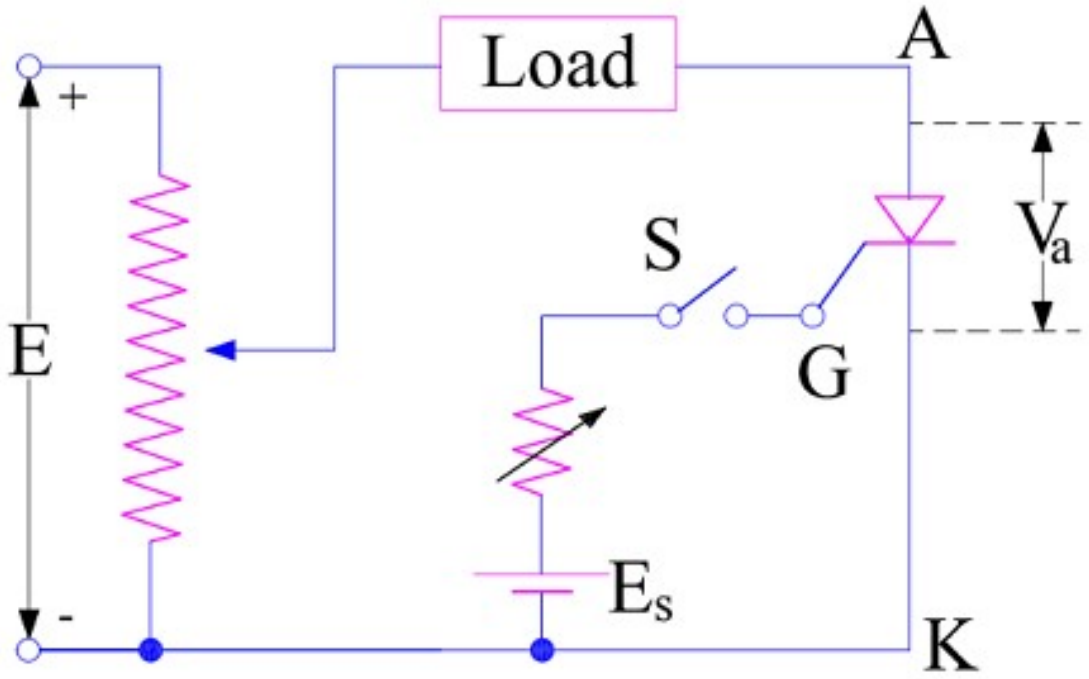




Thyristor

# CIRCUIT DIAGRAM

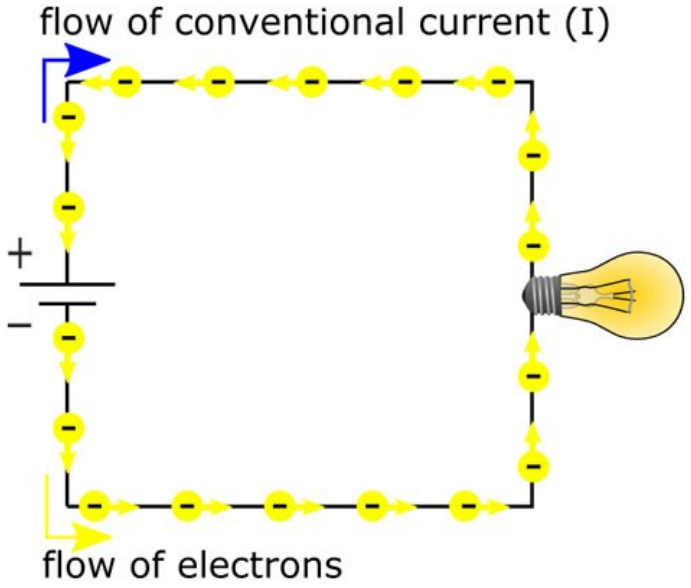



https://www.youtube.com/watch?v=xefULD5GEpo

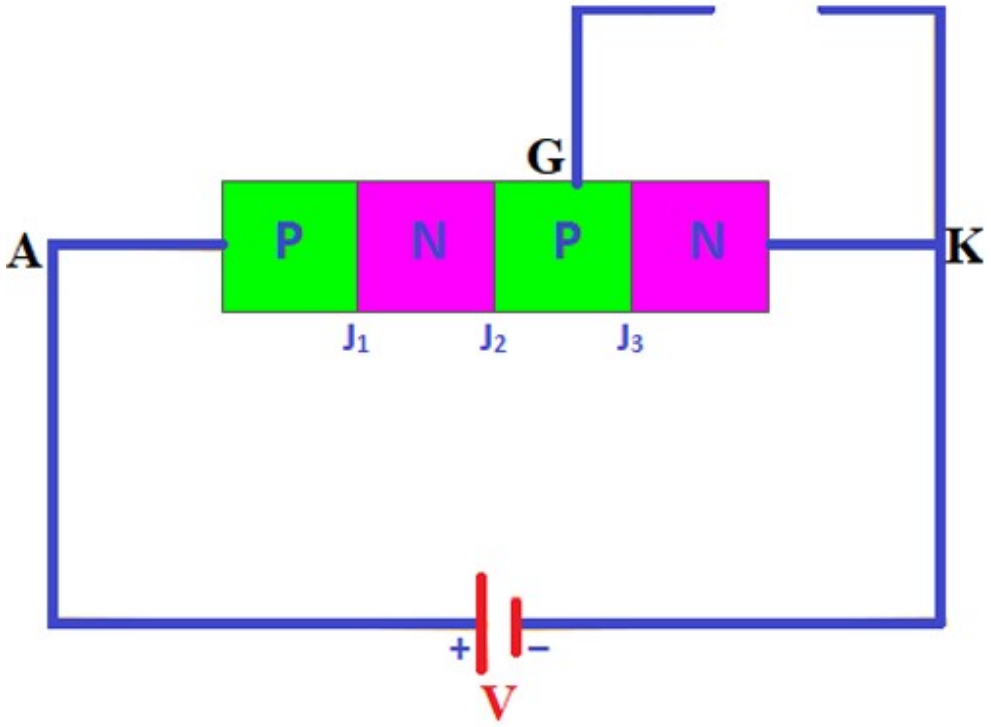
# How SCR works:

Forward Blocking mode

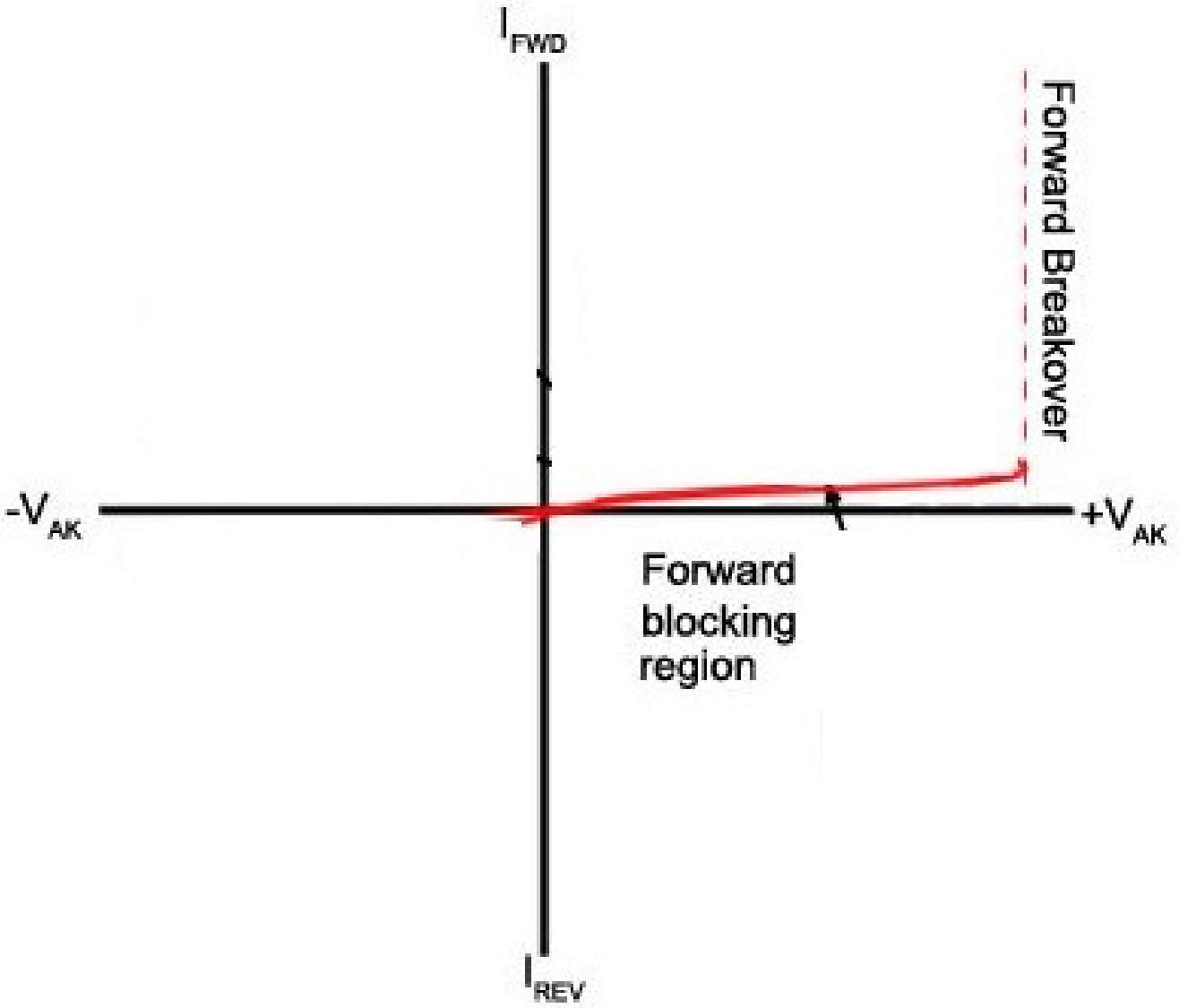

Forward Conduction mode

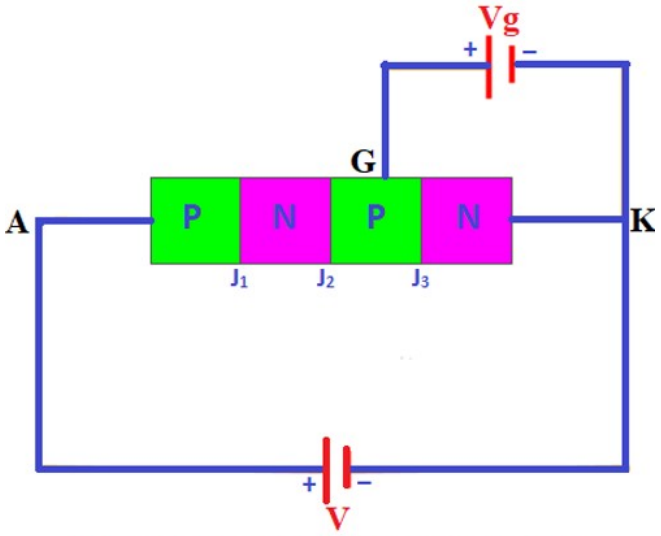



Reverse Blocking mode

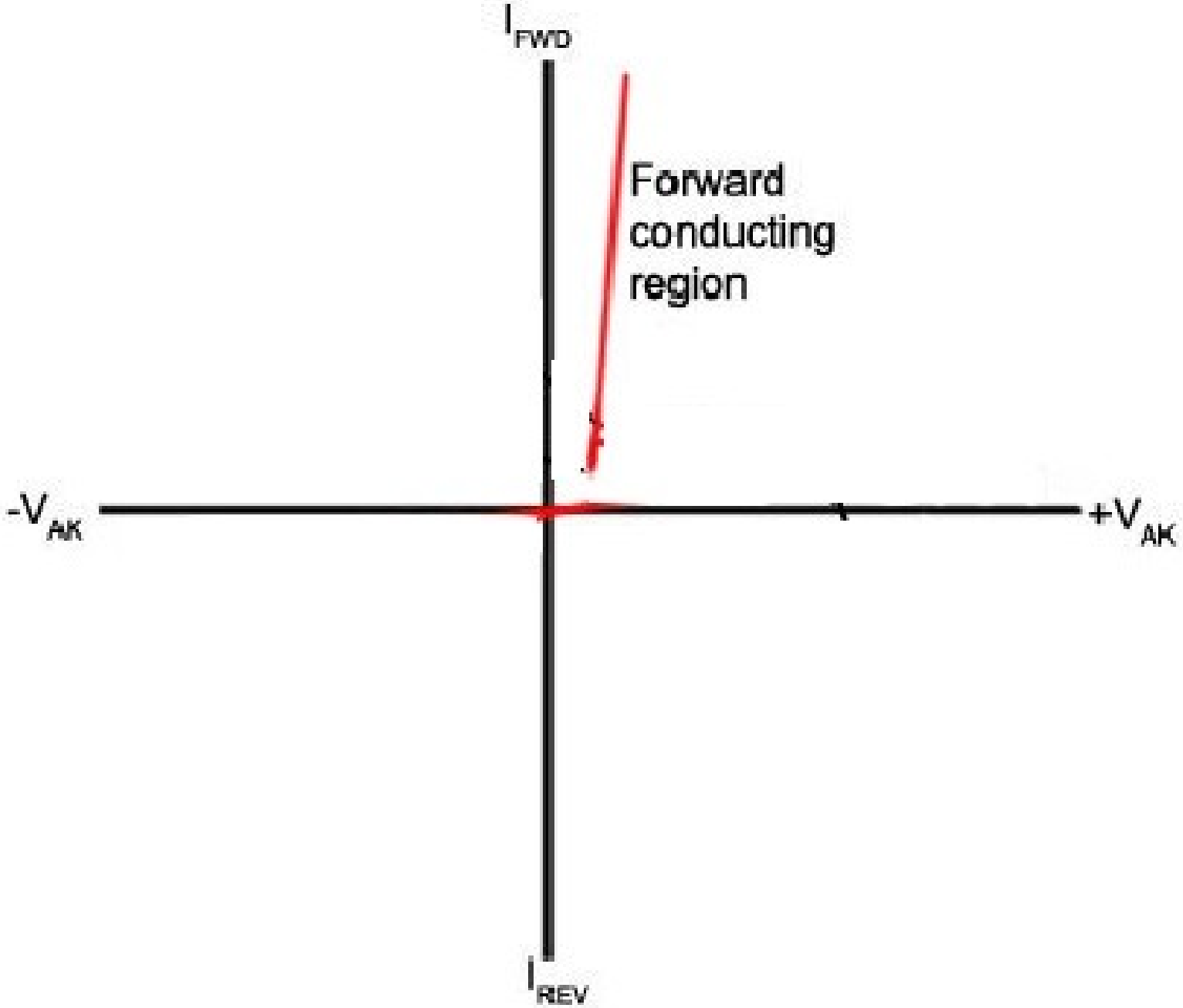


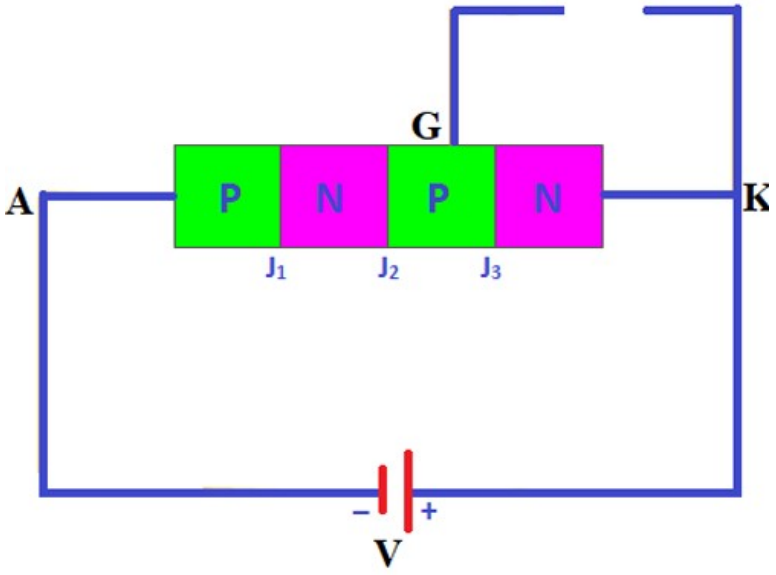

Forward Blocking Mode of SCR



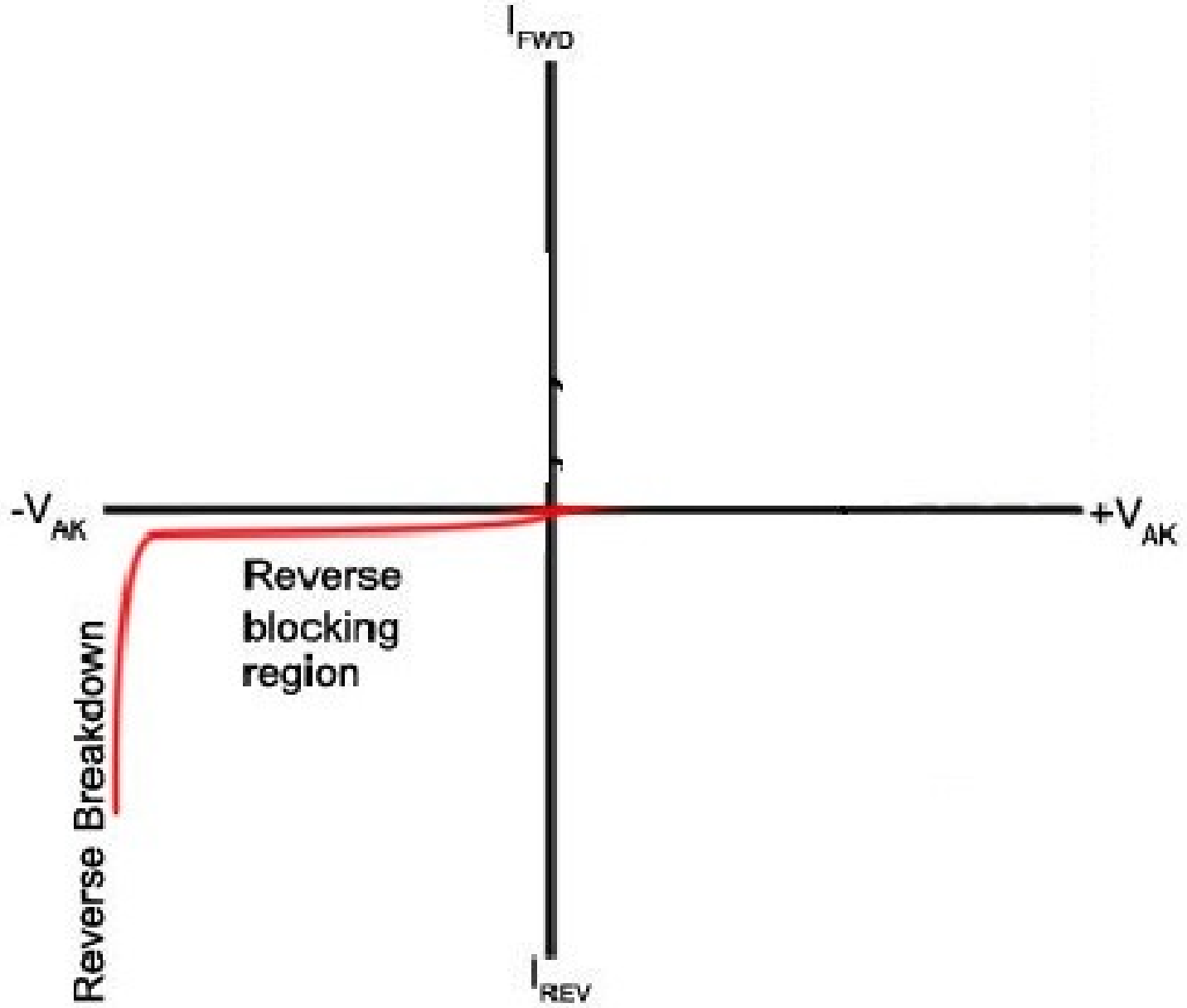



Forward Conducting Mode of SCR





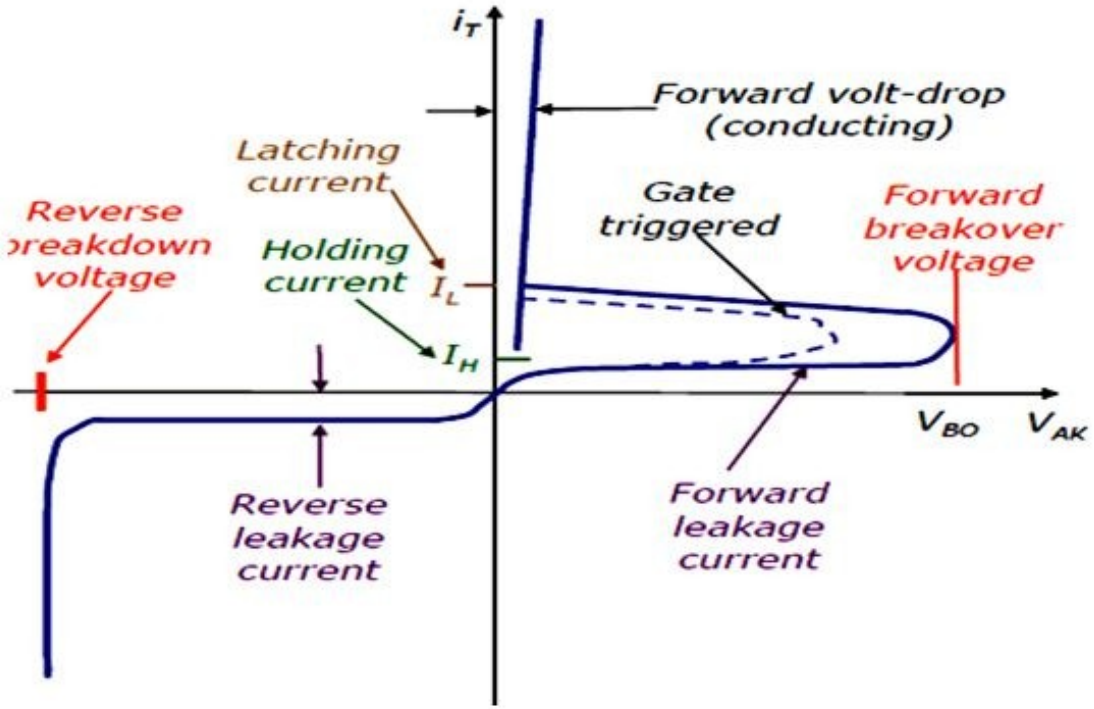

Reverse Blocking Mode of SCR



# Thyristor Operating modes

Thyristors have three modes :

- **Forward blocking mode:** Only leakage current flows, so thyristor is not conducting.
- **Forward conducting mode:** large forward current flows through the thyristor.
- **Reverse blocking mode:** When cathode voltage is increased to reverse breakdown voltage , Avalanche breakdown occurs and large current flows.



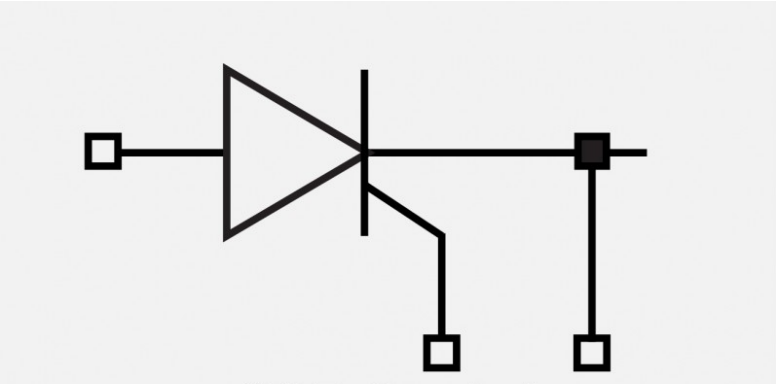
## Advantages of Silicon Controlled Rectifier

- ✓ As compared with electromechanical or mechanical switch, SCR has no moving parts. Hence, with a high efficiency it can deliver noiseless operation.
- ✓ The switching speed is very high as it can perform 1 nano operations per second.
- ✓ These can be operated at high voltage and current ratings with a small gate current.
- ✓ More suitable for AC operations because at every zero position of the AC cycle the SCR will automatically switch OFF.
- ✓ Small in size, hence easy to mount and trouble free service.

# Application

# ASSESSMENT

**Find the Difference and justify it.**



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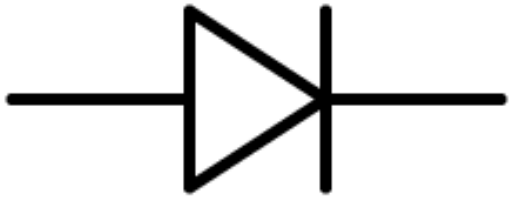

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## References


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4. https://www.youtube.com/watch?v=9h7_vDUE908
5. https://www.youtube.com/watch?v=npRk_P5A5cs