



# 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

**19MCB302 -IE- INDUSTRIAL ELECTRONICS**  
III YEAR V SEM

### UNIT 1 – INTRODUCTION TO POWER ELECTRONICS

#### TOPIC – TRIAC

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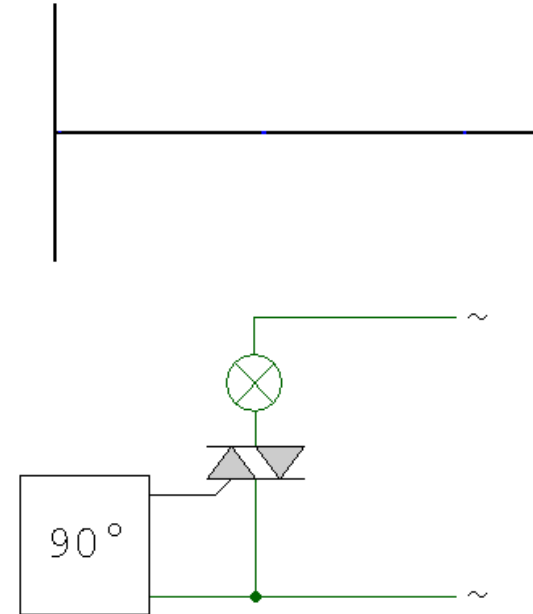
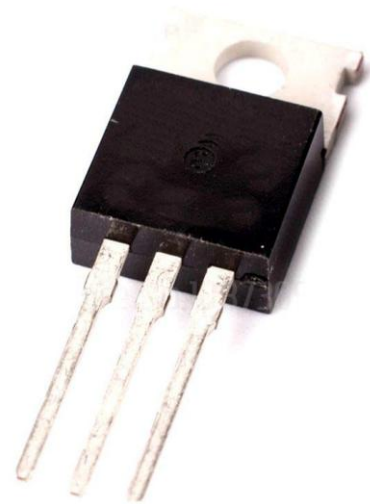
## APPLICATION





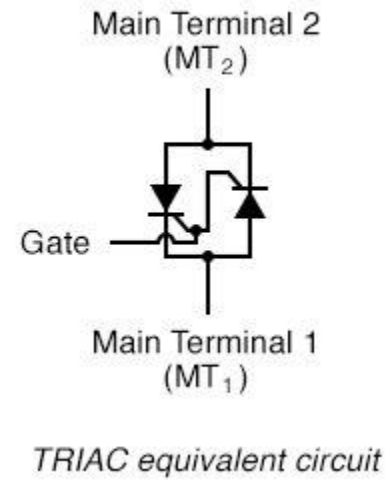
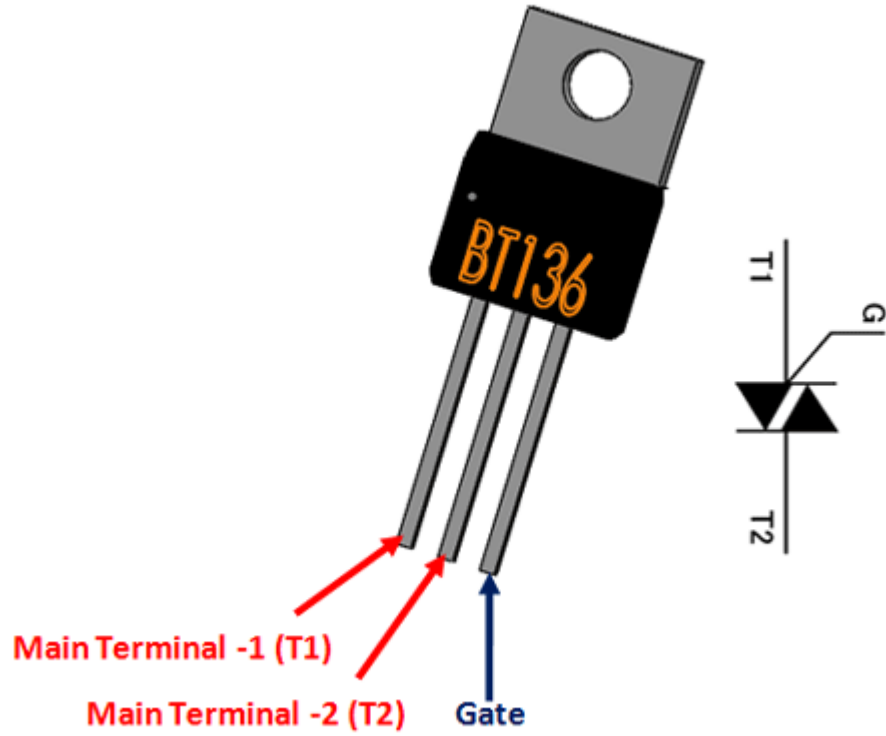
## TRIAC

**TRIAC** (triode for alternating current) is a generic trademark for a three terminal electronic component that conducts current in either direction when triggered..

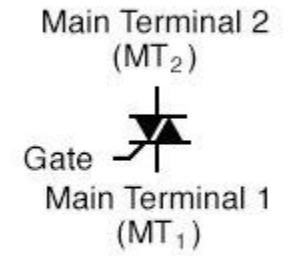




# SYMBOL



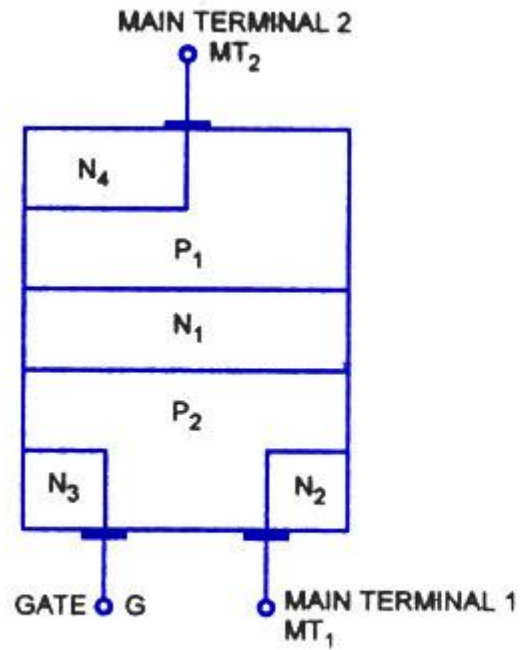
TRIAC equivalent circuit



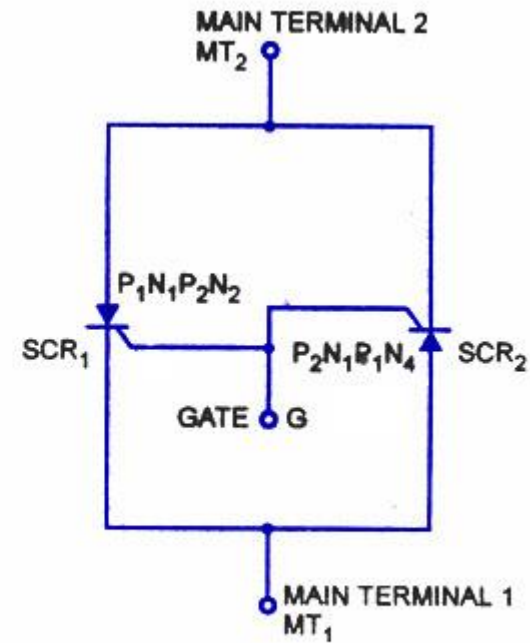
TRIAC schematic symbol



## LAYER



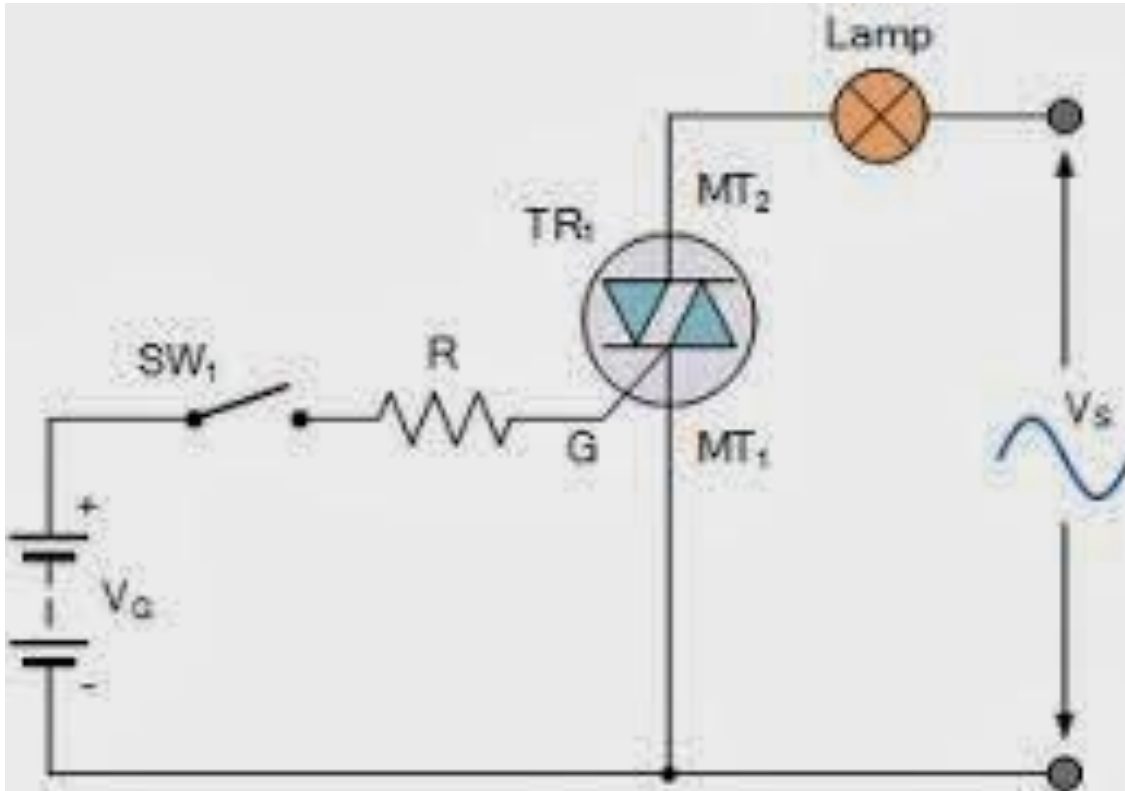
*Basic Structure*



*Electrical Equivalent Circuit*



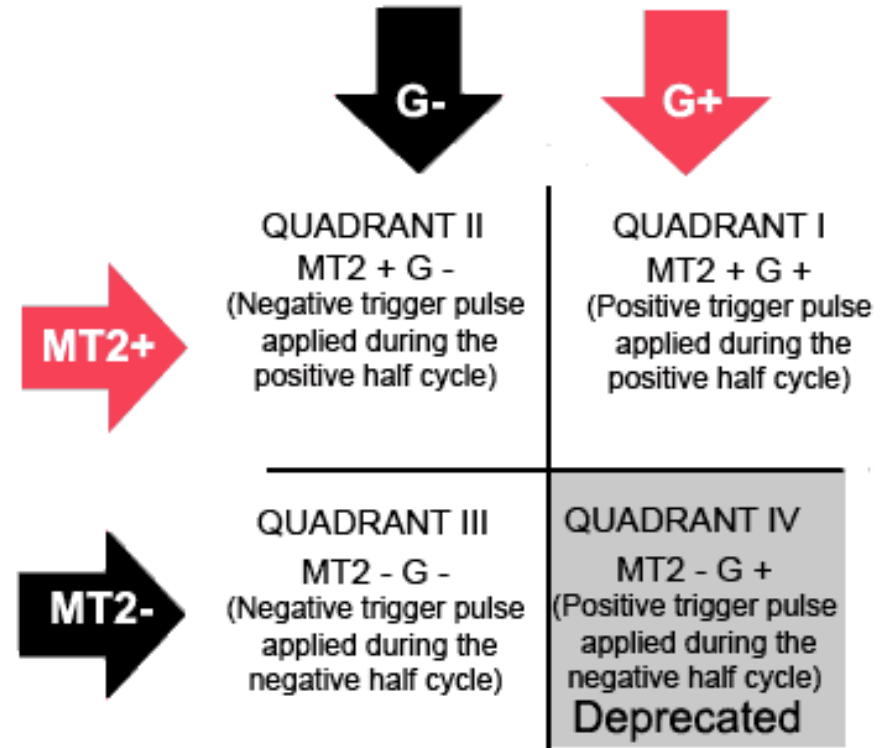
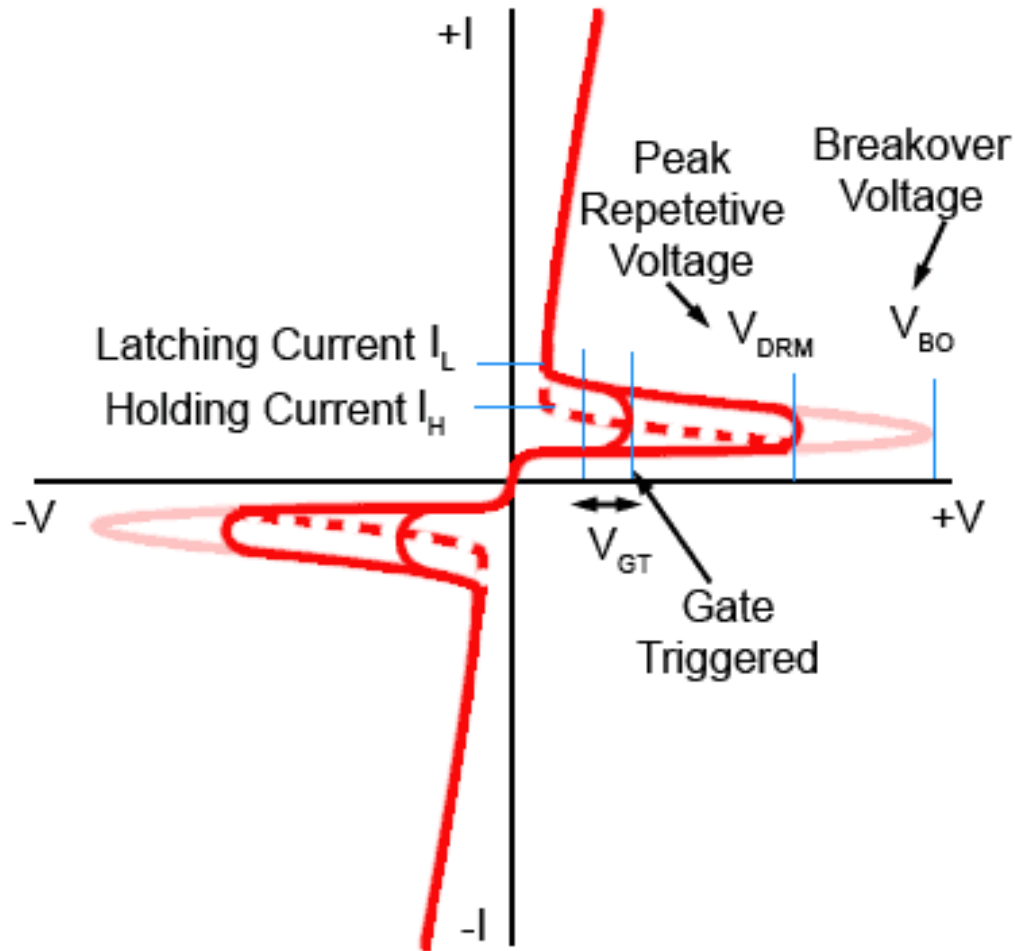
## CIRCUIT DIAGRAM



[https://www.youtube.com/watch?v=-A\\_Mi-Xncqg](https://www.youtube.com/watch?v=-A_Mi-Xncqg)



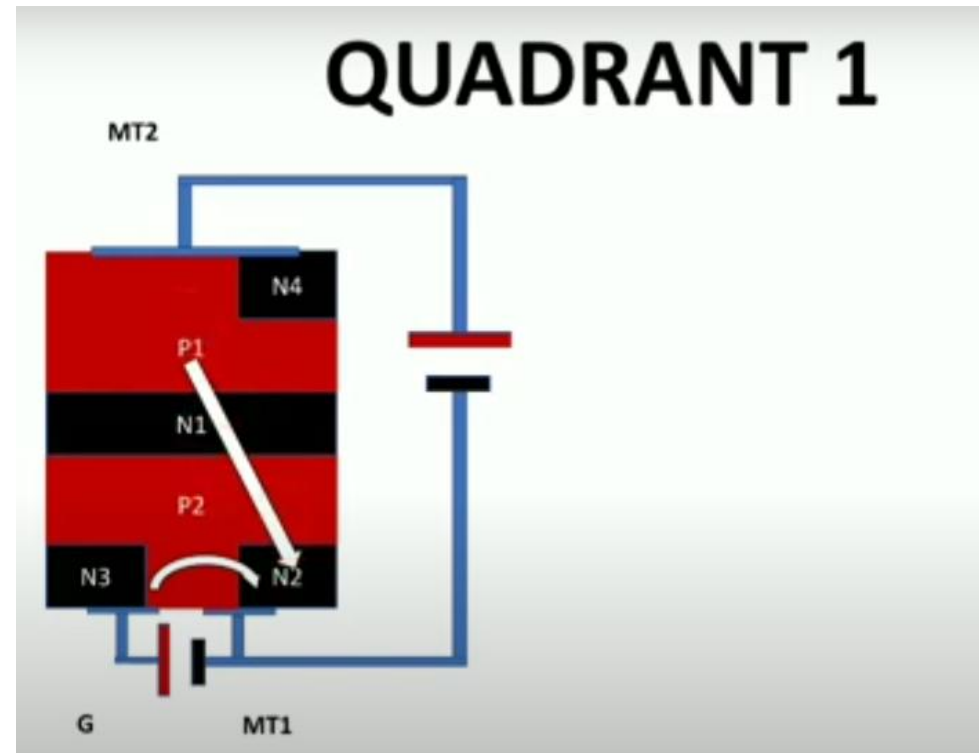
# CHARACTERISTIC DIAGRAM





## MODE OF OPERATION:

1. MT2 is positive with respect to MT1 with a gate polarity positive with respect to MT1.

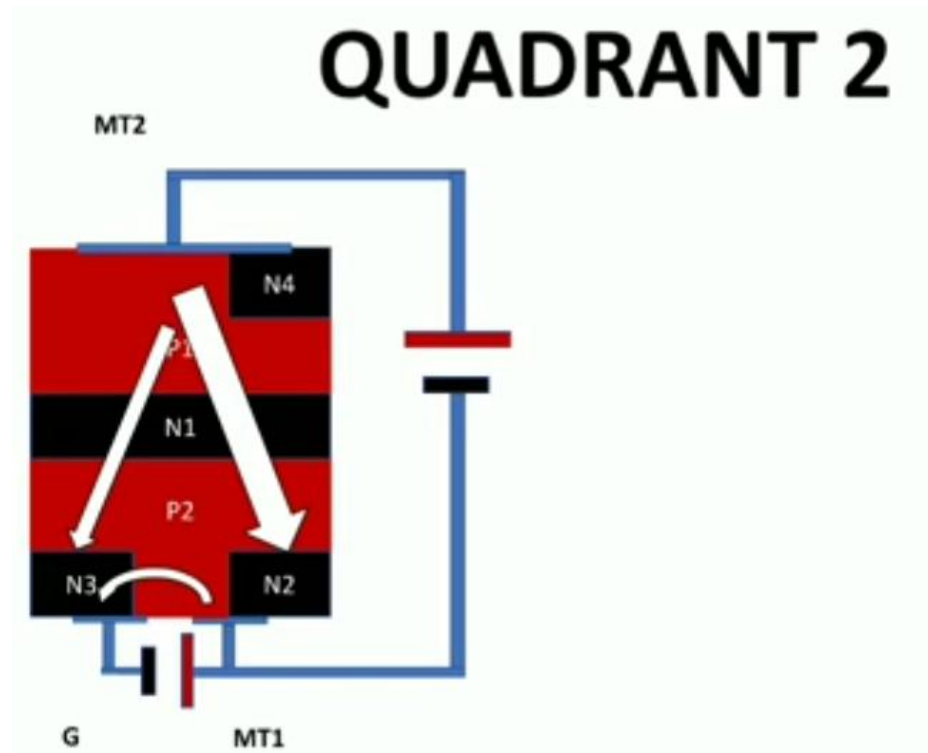






## MODE OF OPERATION:

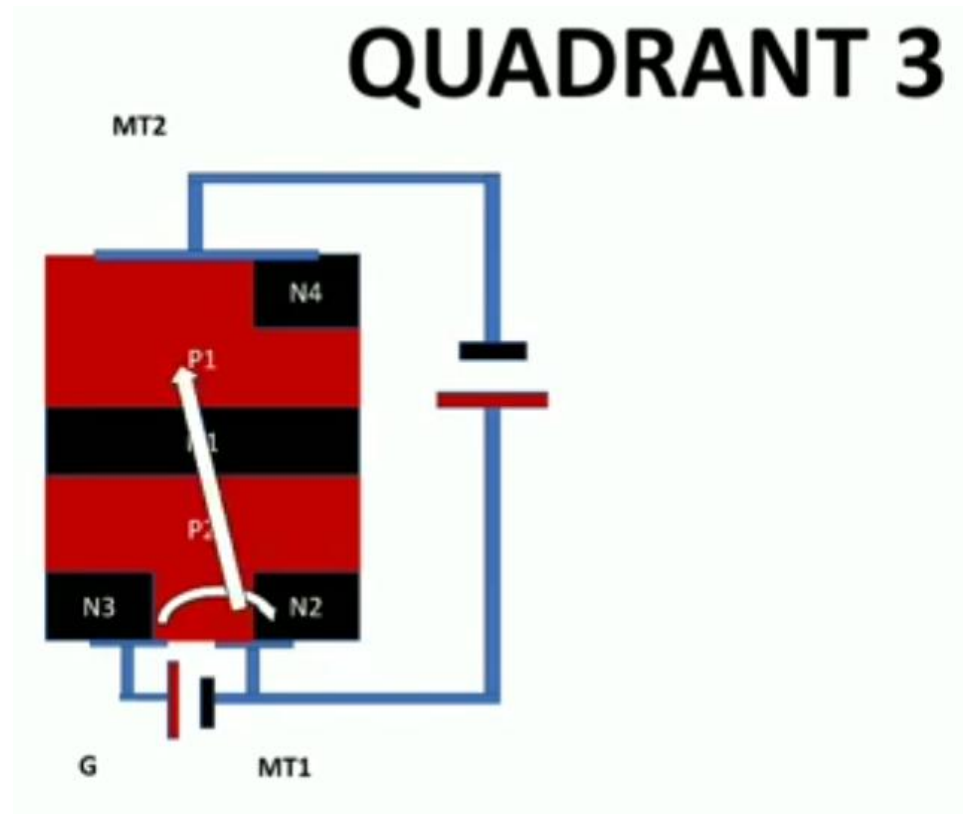
1. MT2 is positive with respect to MT1 with a gate polarity negative with respect to MT1.





## MODE OF OPERATION:

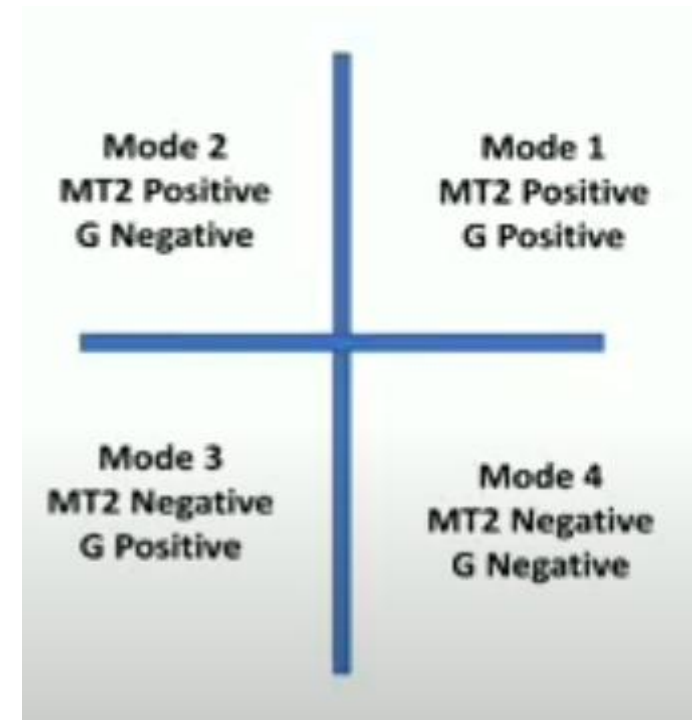
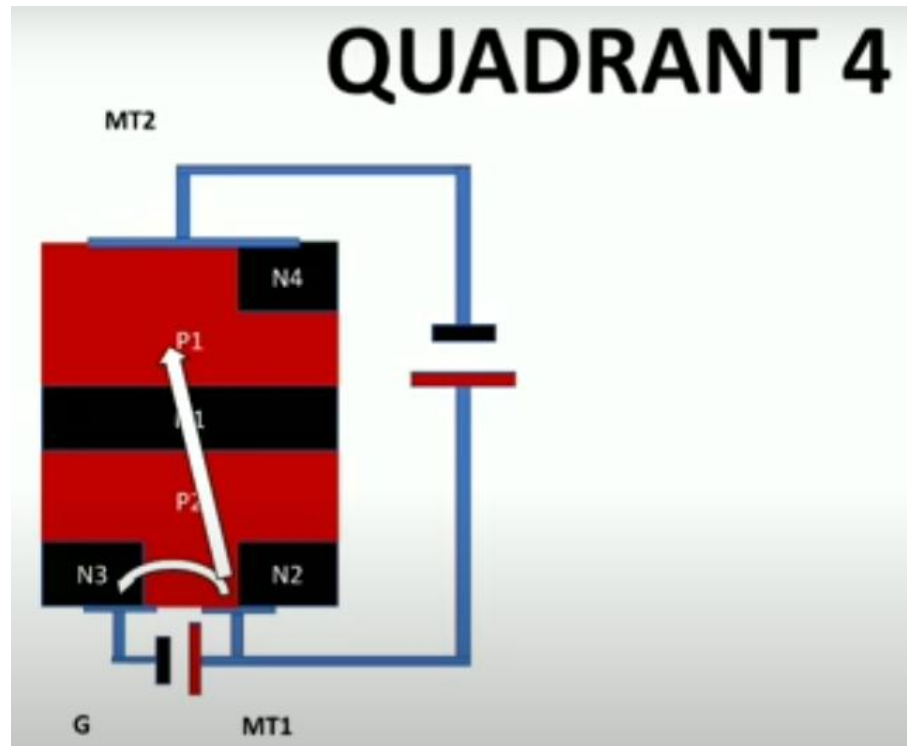
1. MT2 is negative with respect to MT1 with a gate polarity negative with respect to MT1.





## MODE OF OPERATION:

1. MT2 is negative with respect to MT1 with a gate polarity positive with respect to MT1.





## Advantage:

- The TRIAC need single fuse for protection.
- It can be triggered with positive or negative polarities of gate pulses.
- A safe breakdown in either direction is possible but for SCR protection should be given with parallel diode.
- It needs only a single heat sink of slightly larger size where as for SCR two heat sinks should be required of smaller size.
- When the voltage is reduced to zero the TRIAC turns OFF.

## Disadvantages:

- It can be triggered in any direction so we need to be careful about triggering circuit.
- As compared to SCR (silicon controlled rectifier) it has low ratings.
- The TRIACs are not much reliable as compared to SCR.
- This is not suitable for DC applications.
- The  $dv/dt$  rating is very low as compared to SCR.
- It has a very high switching delay.



## ASSESSMENT

**Can we adjust the illumination of the bulb....? Justify.**





## References

1. <https://components101.com/articles/triac-symbol-working-and-application-circuits>
2. <https://www.electrical4u.com/triac/>
3. [https://www.electronics-notes.com/articles/electronic\\_components/scr/what-is-a-triac.php](https://www.electronics-notes.com/articles/electronic_components/scr/what-is-a-triac.php)
4. <https://www.youtube.com/watch?v=rIMexAWE6Cc>
5. <https://www.youtube.com/watch?v=qGQdbUiTd54>

