SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
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DEPARTMENT OF MECHATRONICS

16MC302 – INDUSTRIAL ELECTRONCIS & APPLICATION

III YEAR V SEM

UNIT 1 – INTRODUCTION TO POWER ELECTRONICS

TOPIC – **TRIAC**

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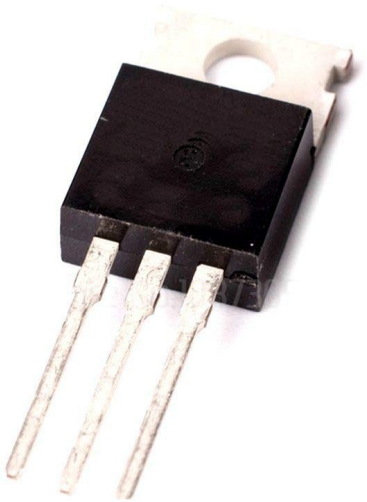
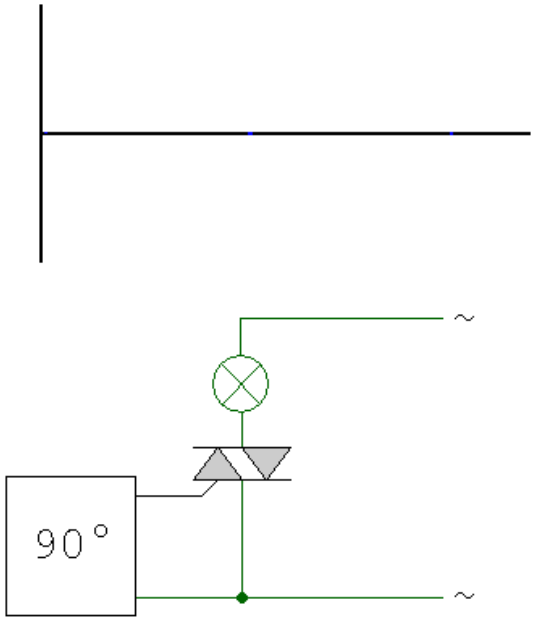
APPLICATION

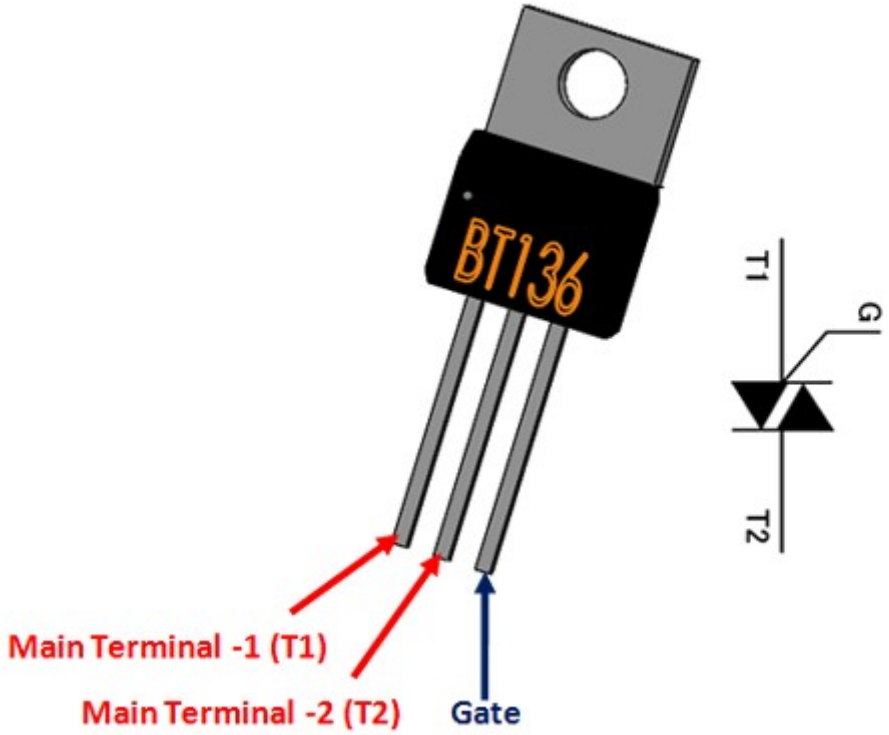
TRIAC

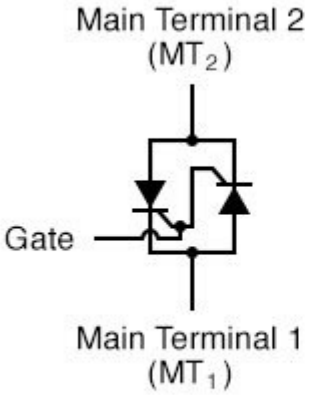
TRIAC (triode for alternating current) is a generic trademark for a three terminal electronic component that conducts current in either direction when triggered..



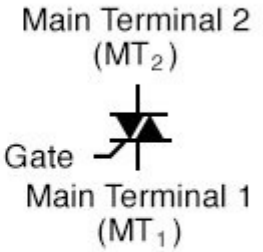


SYMBOL



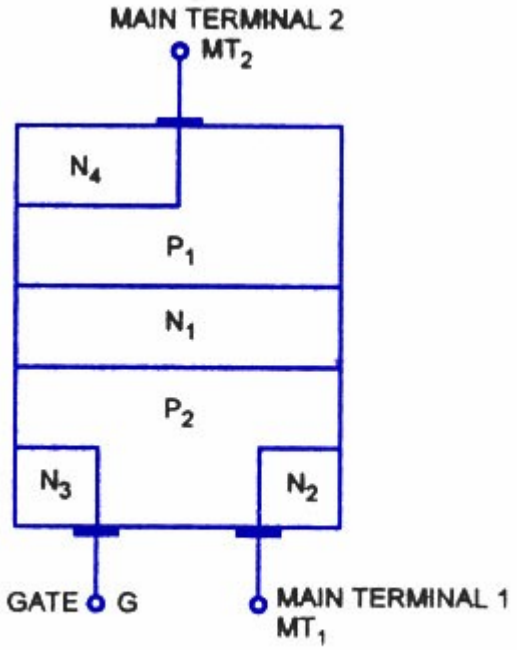


TRIAC equivalent circuit

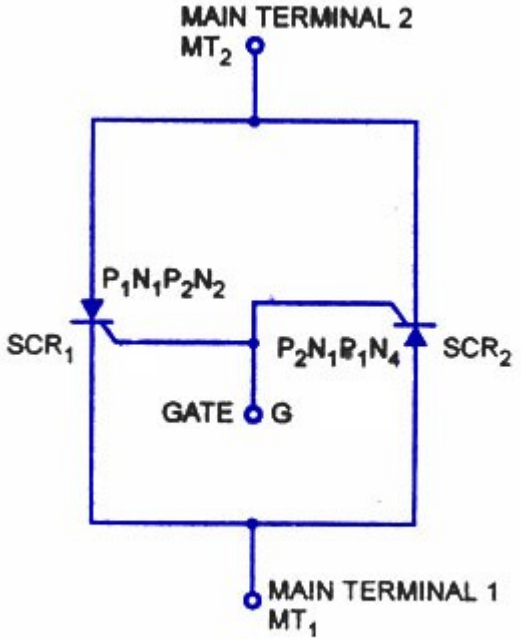


TRIAC schematic symbol

LAYER

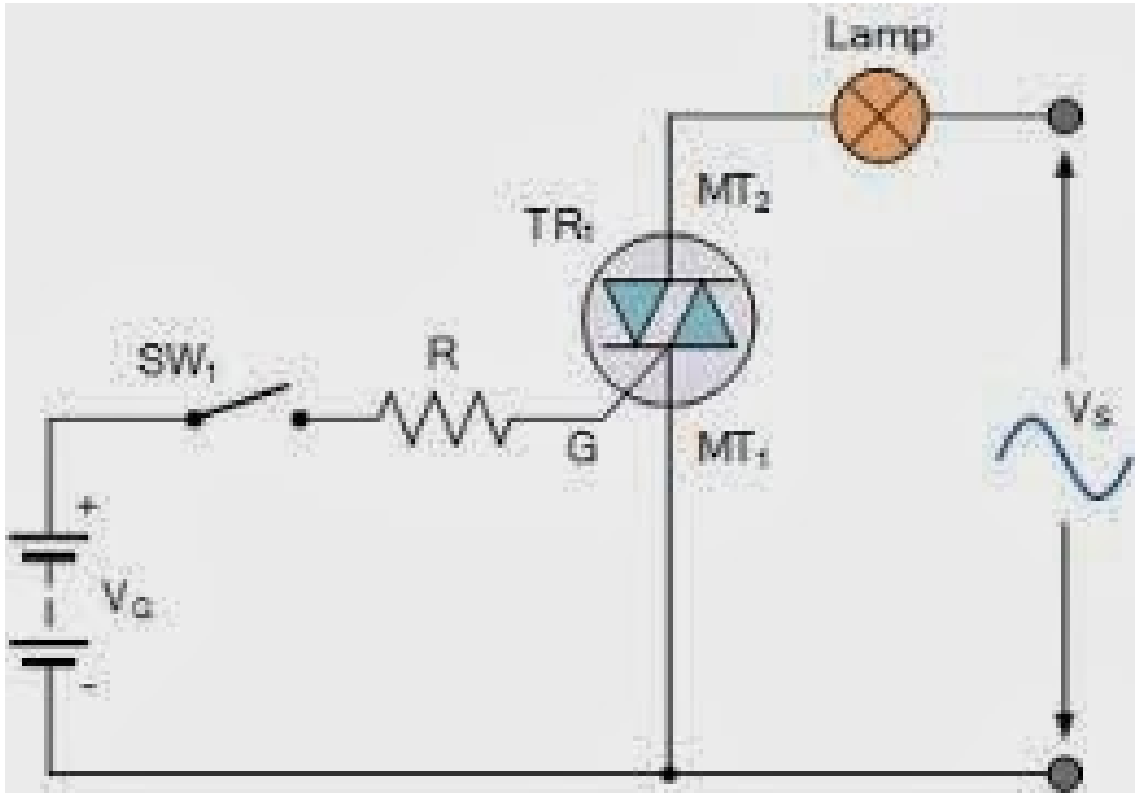


Basic Structure



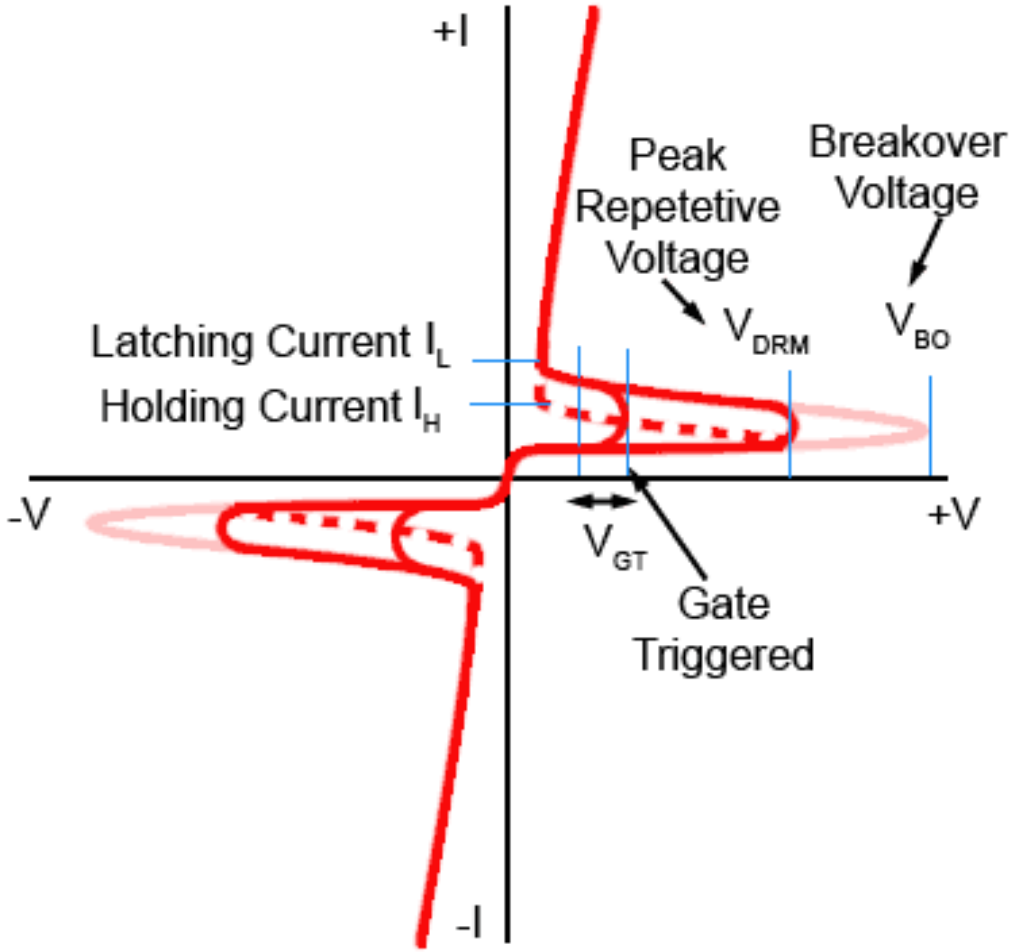
Electrical Equivalent Circuit

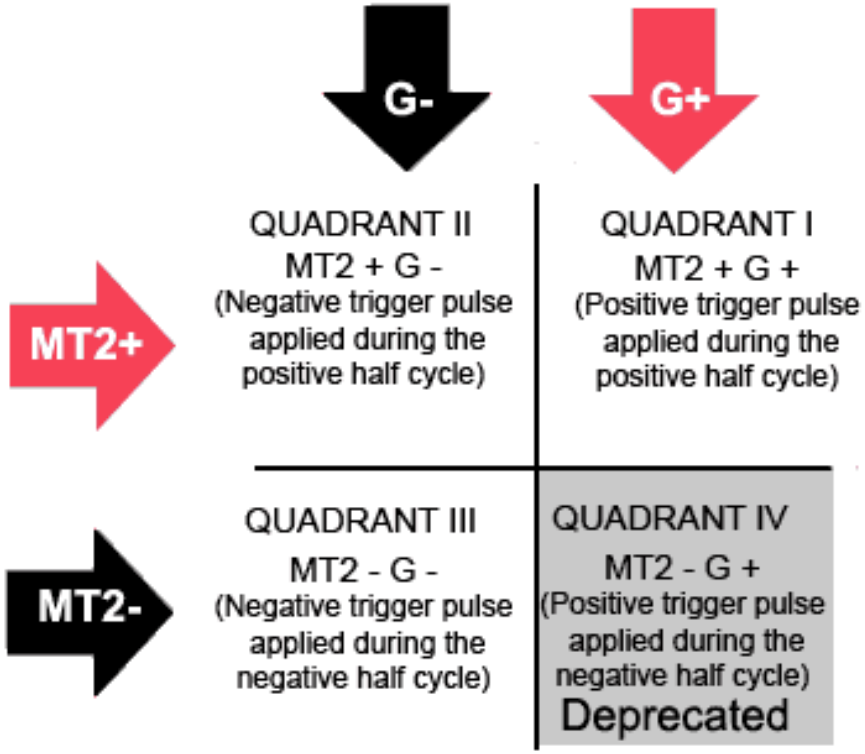
CIRCUIT DIAGRAM



https://www.youtube.com/watch?v=-A_Mi-Xncqg

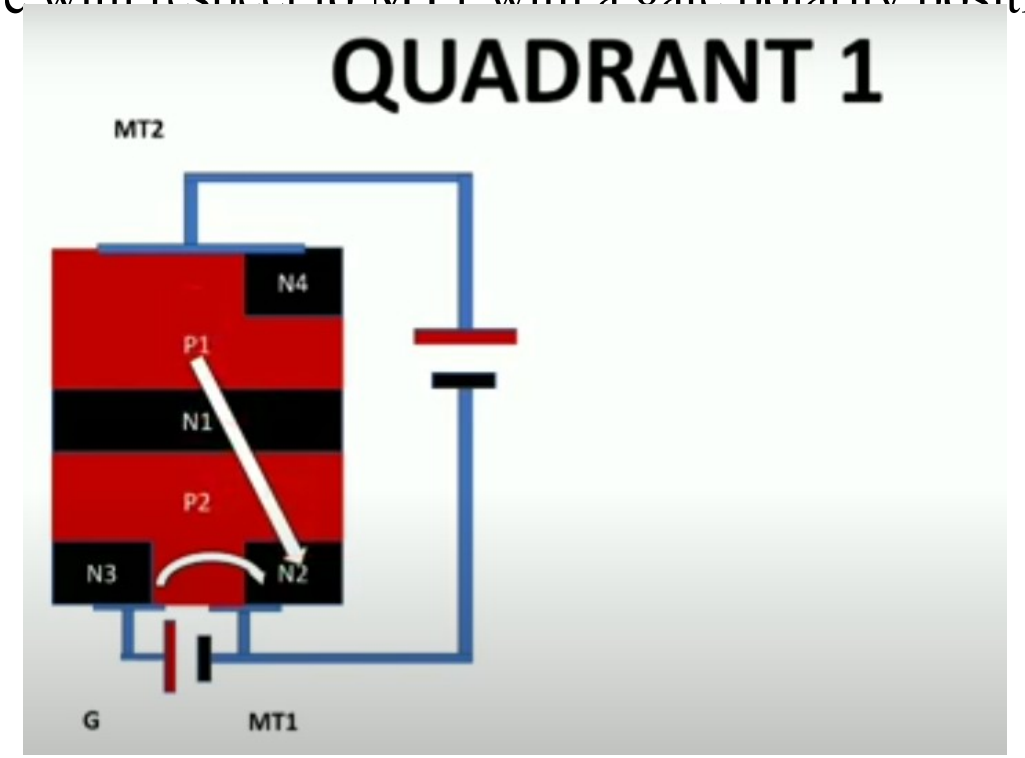
CHARACTERISTIC DIAGRAM





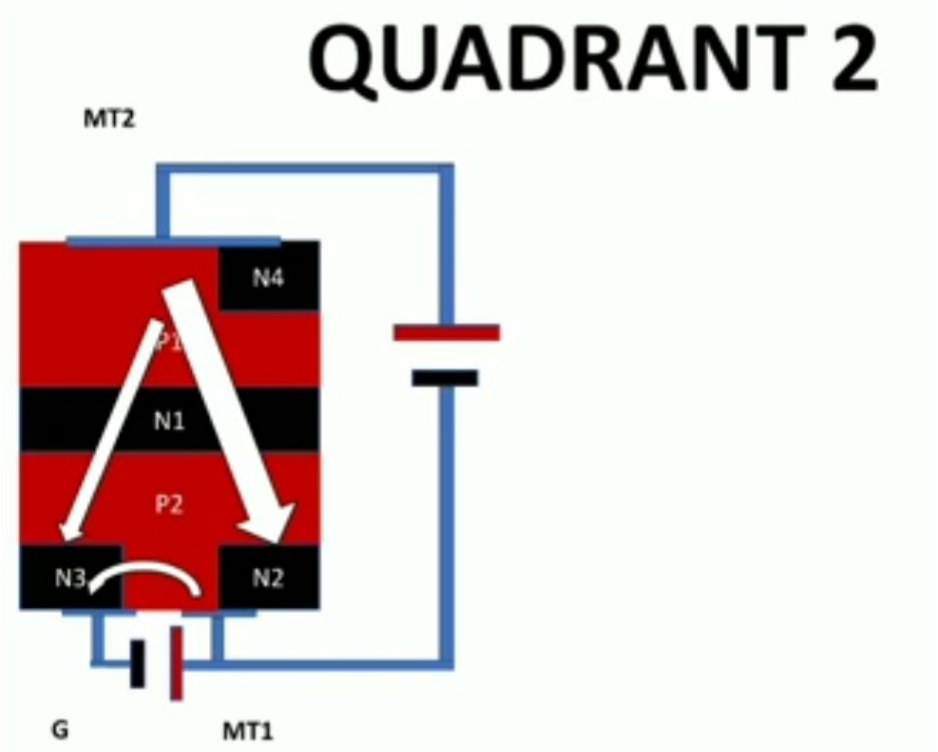
MODE OF OPERATION:

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



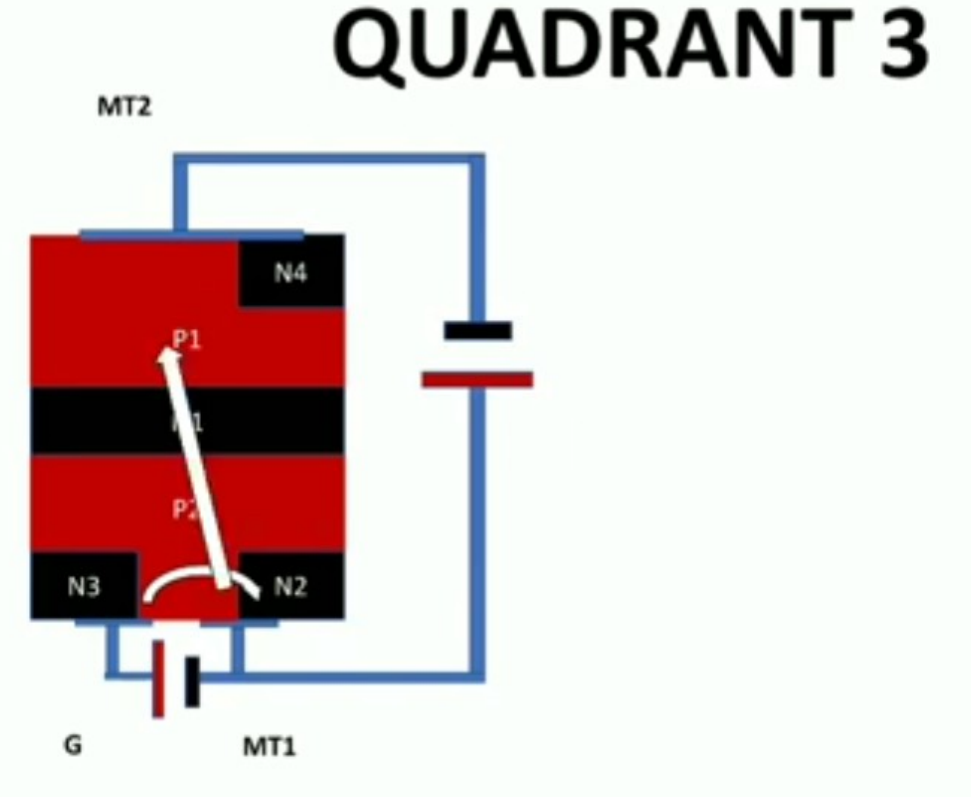
MODE OF OPERATION:

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



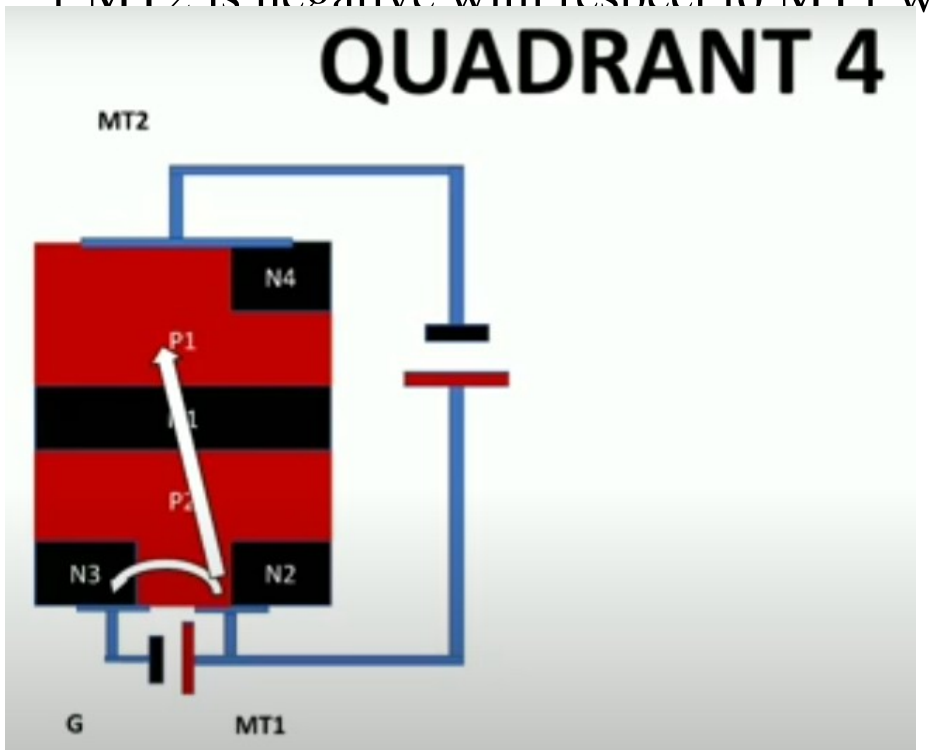
MODE OF OPERATION:

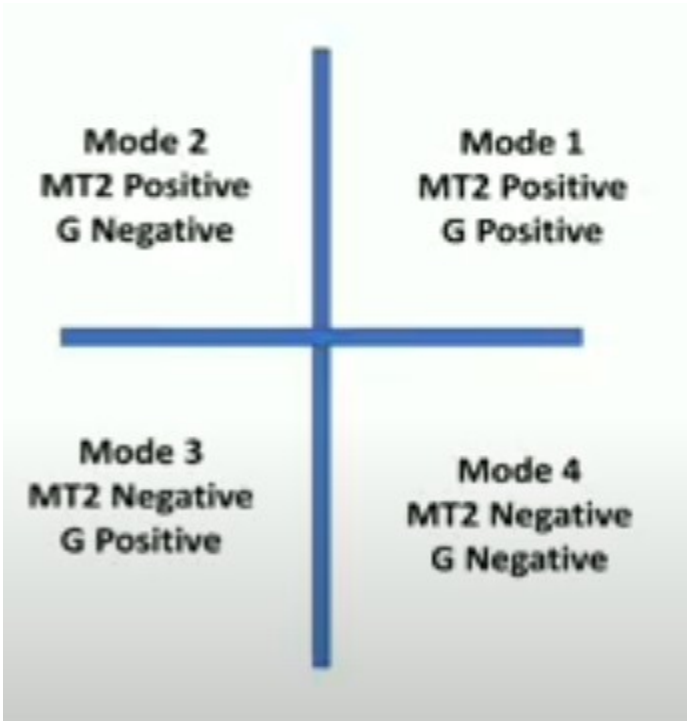
1.MT2 is negative with respect to MT1 with a gate polarity negative with respect to MT1.



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
4. https://www.youtube.com/watch?v=rIMexAWE6Cc
5. https://www.youtube.com/watch?v=qGQdbUiTd54