



# 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 –IGBT

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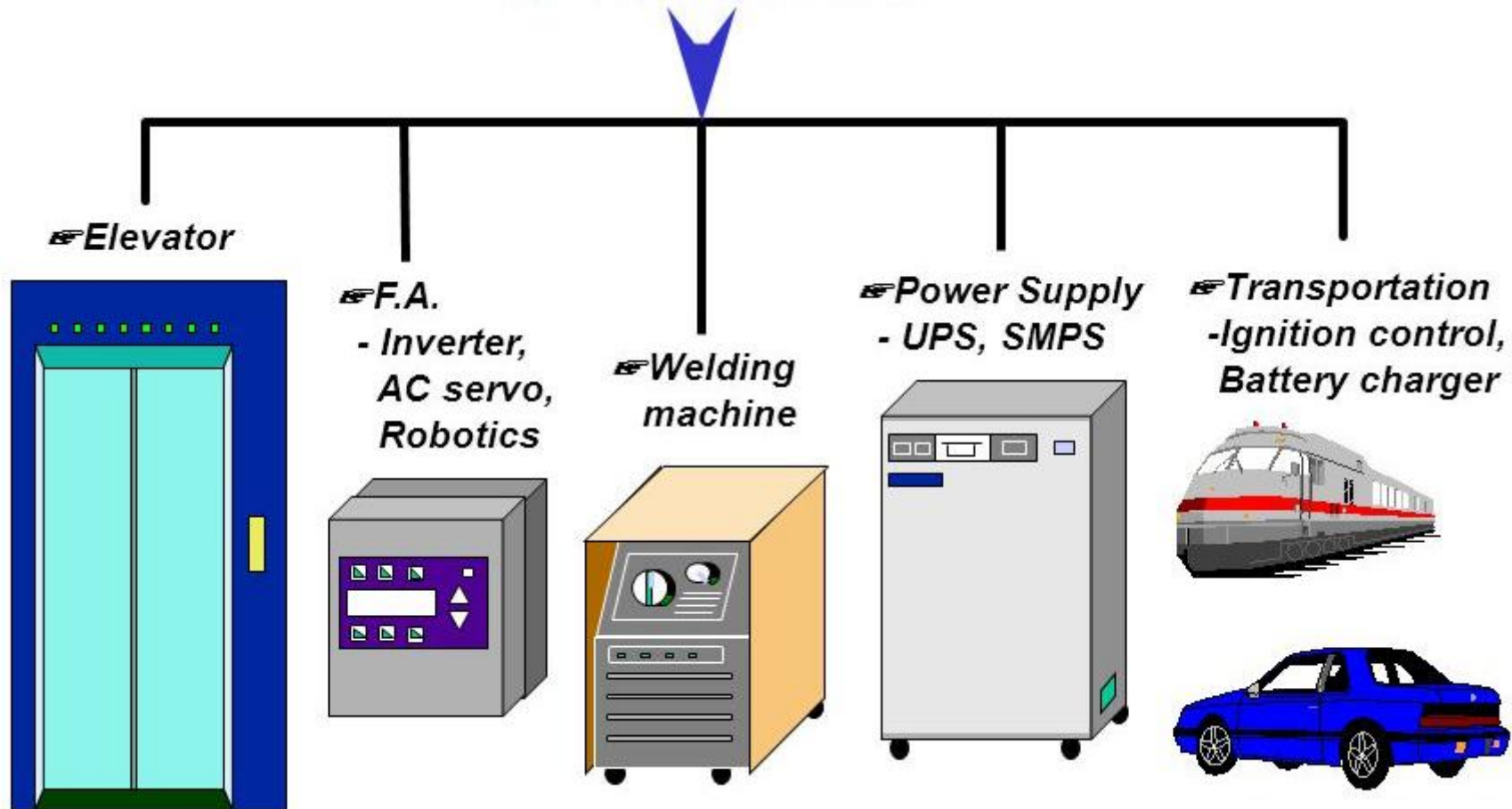
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SNSCT, Coimbatore.



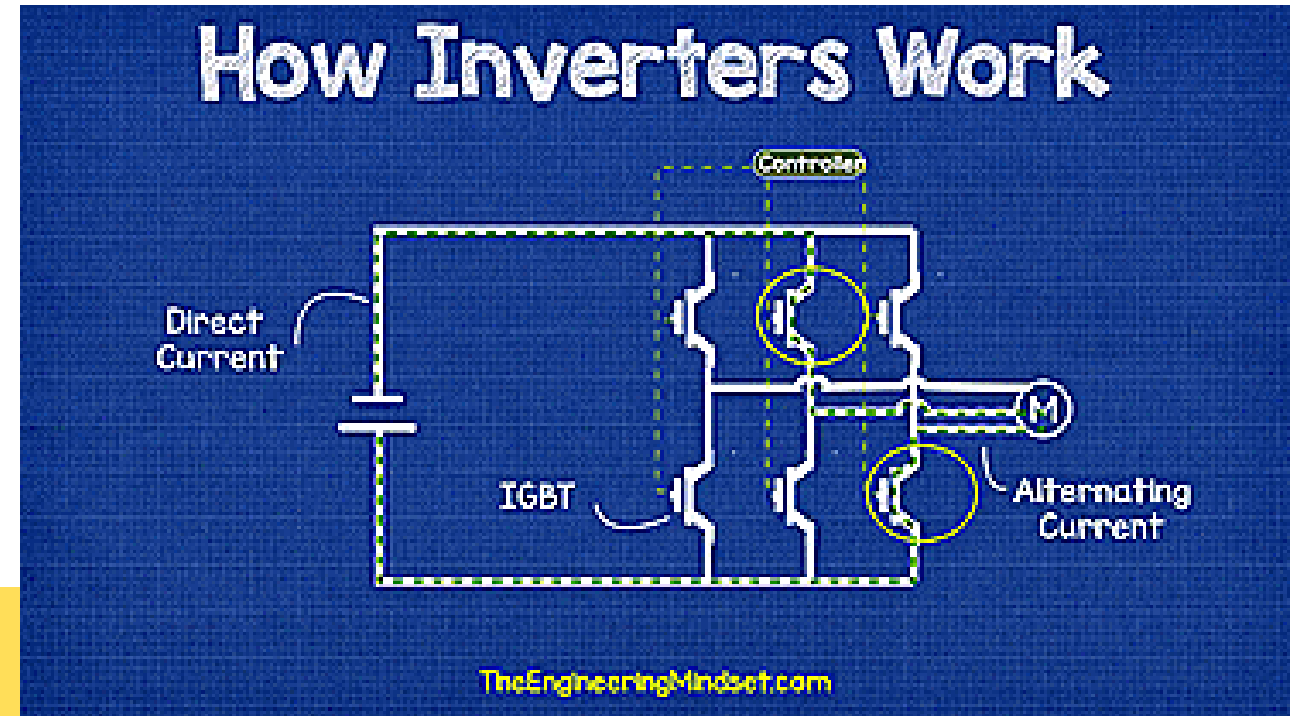
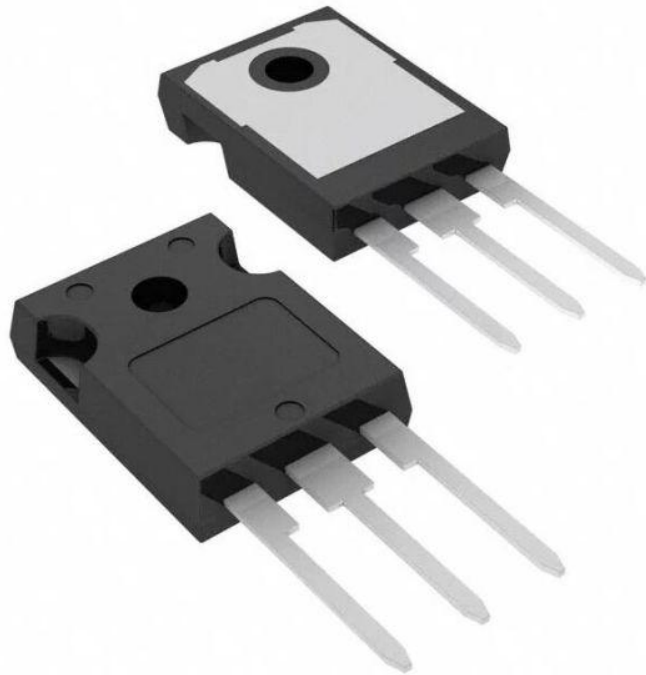
# APPLICATION





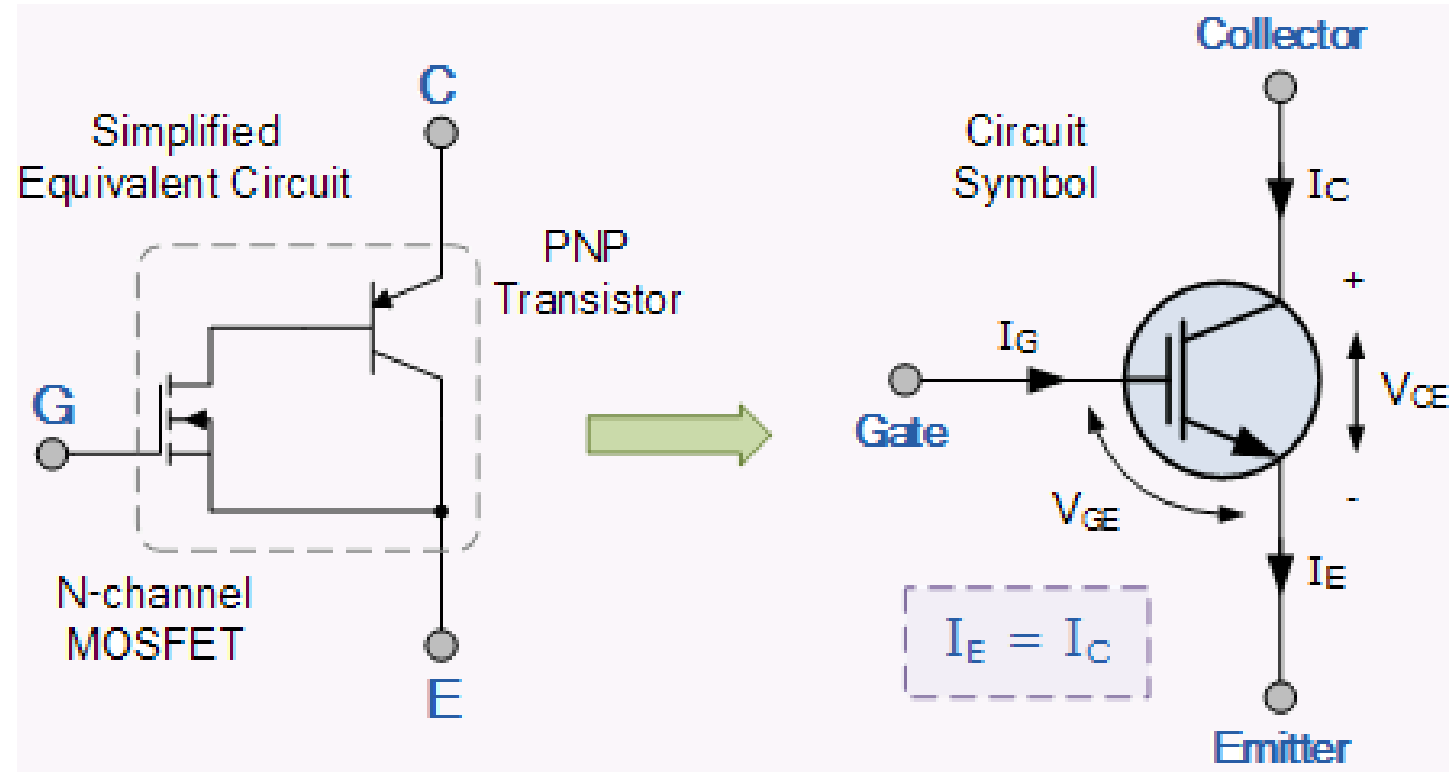
## IGBT

An insulated-gate bipolar transistor (**IGBT**) is a three-terminal power semiconductor device primarily used as an electronic switch which, as it was developed, came to combine high efficiency and fast switching.



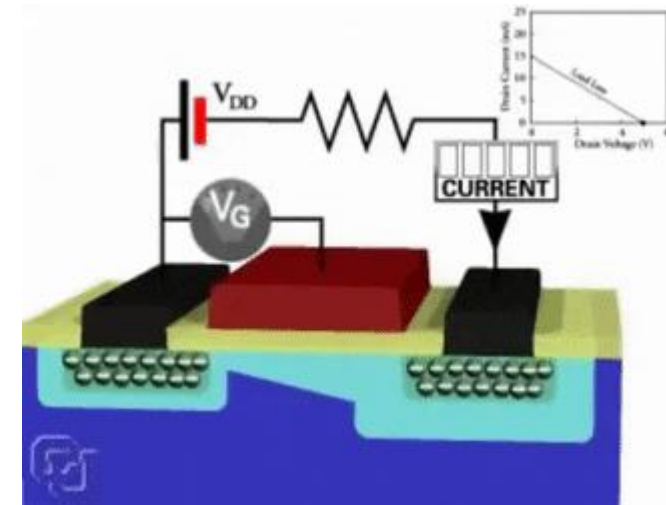
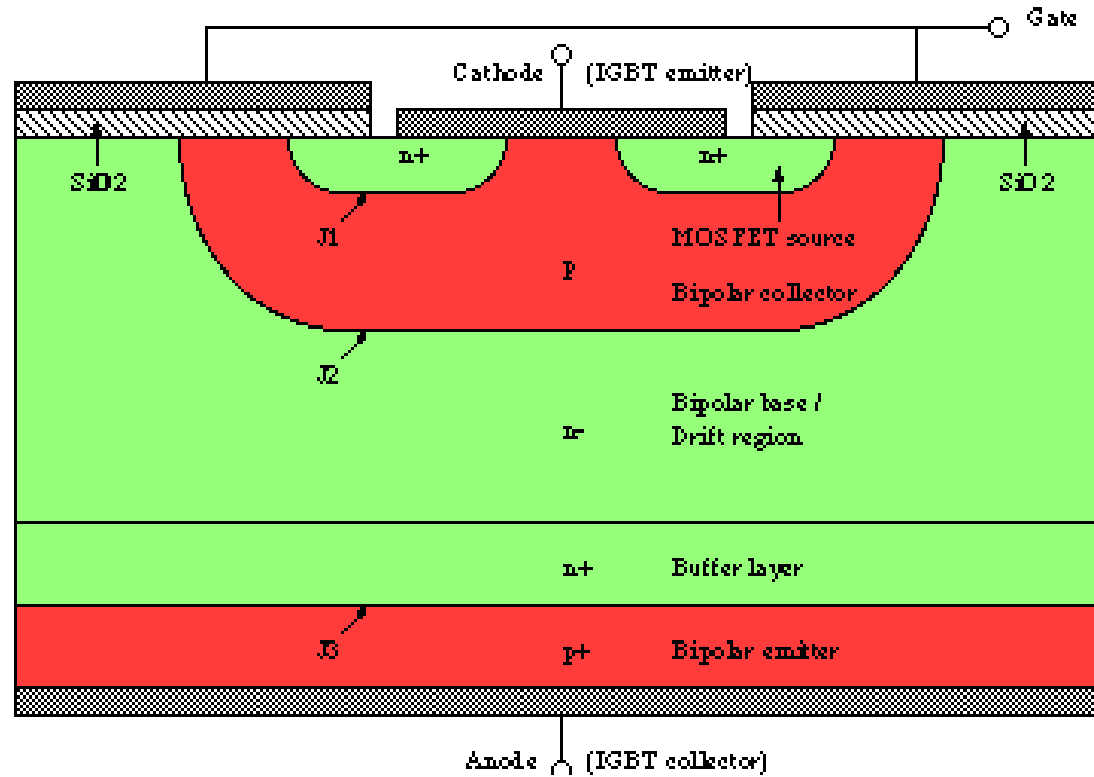


## SYMBOL



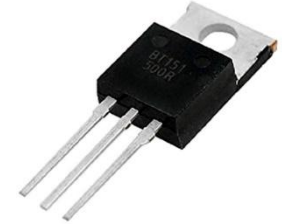
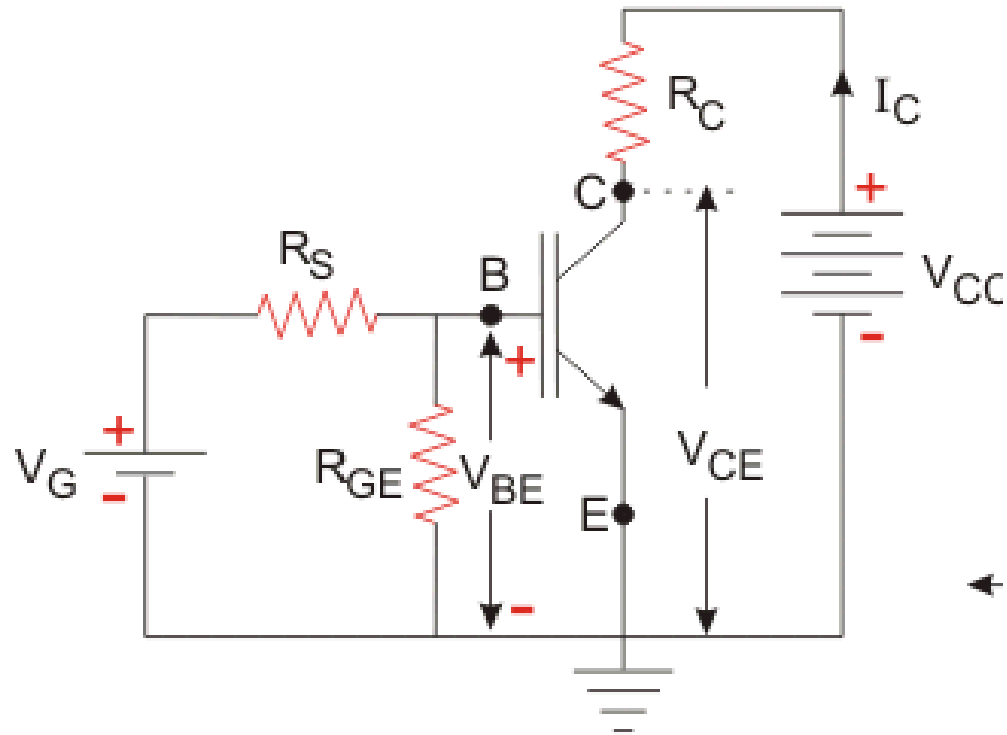


# LAYER





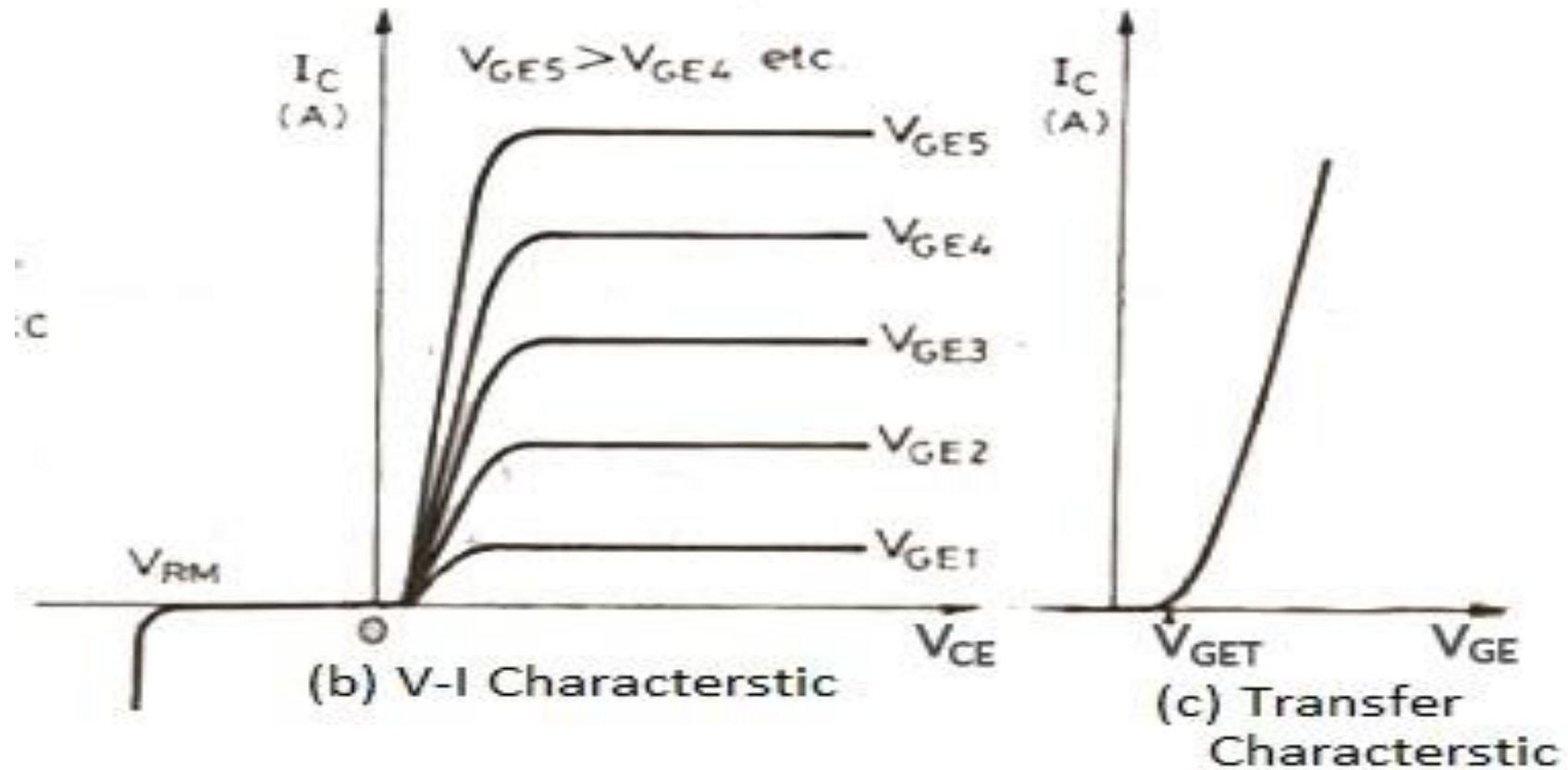
## CIRCUIT DIAGRAM



<https://www.youtube.com/watch?v=VT6YWEWeMi0>



## CHARACTERISTIC DIAGRAM





## Advantages of IGBT

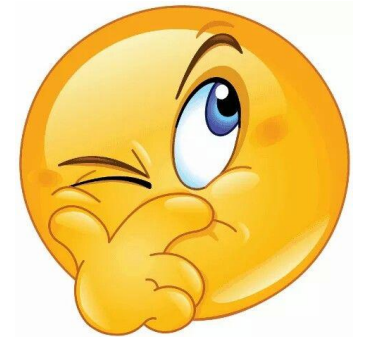
- The insulated gate bipolar transistor (IGBT) is easy to turn ON and OFF.
- The switching frequency is higher than that of power BJT.
- It has a low on state power dissipation.
- It has simpler driver circuit..







Parameter	Power BJT	Power MOSFET	IGBT
Operating frequency	10 kHz	100 kHz	10 kHz
On-state voltage drop	< 2 volts	4-5 volts	3 volts
Trigger circuit	Current controlled needs continuous base drive.	Voltage controlled needs continuous gate drive.	Voltage controlled need continuous gate drive.
Maximum VI Rating	2 kV/ 1000 A	600 V/ 200 A	1500 V/ 400 A
Voltage or Current Controlled	Current controlled	Voltage controlled	Voltage controlled
Parallel Operation	Equalizing circuit required.	Easy to parallel.	Easy to parallel.





## References

1. <https://components101.com/articles/what-is-igbt-working-operation-symbol-and-types>
2. <https://www.electrical4u.com/insulated-gate-bipolar-transistor-igbt/>
3. <https://www.youtube.com/watch?v=ilqhAX0I7II>
4. <https://www.youtube.com/watch?v=VT6YWEWeMi0>

