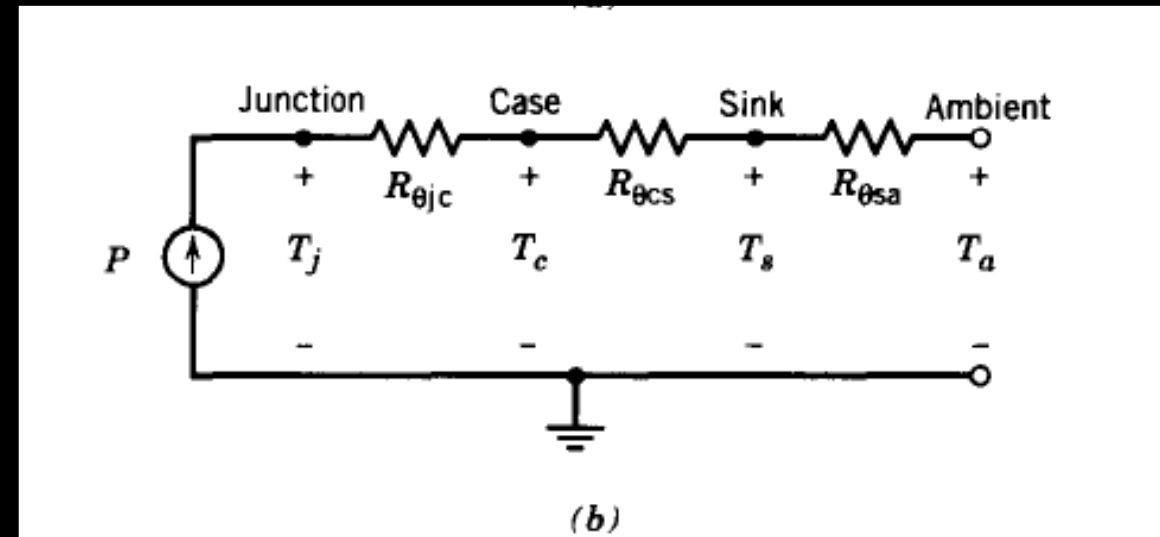
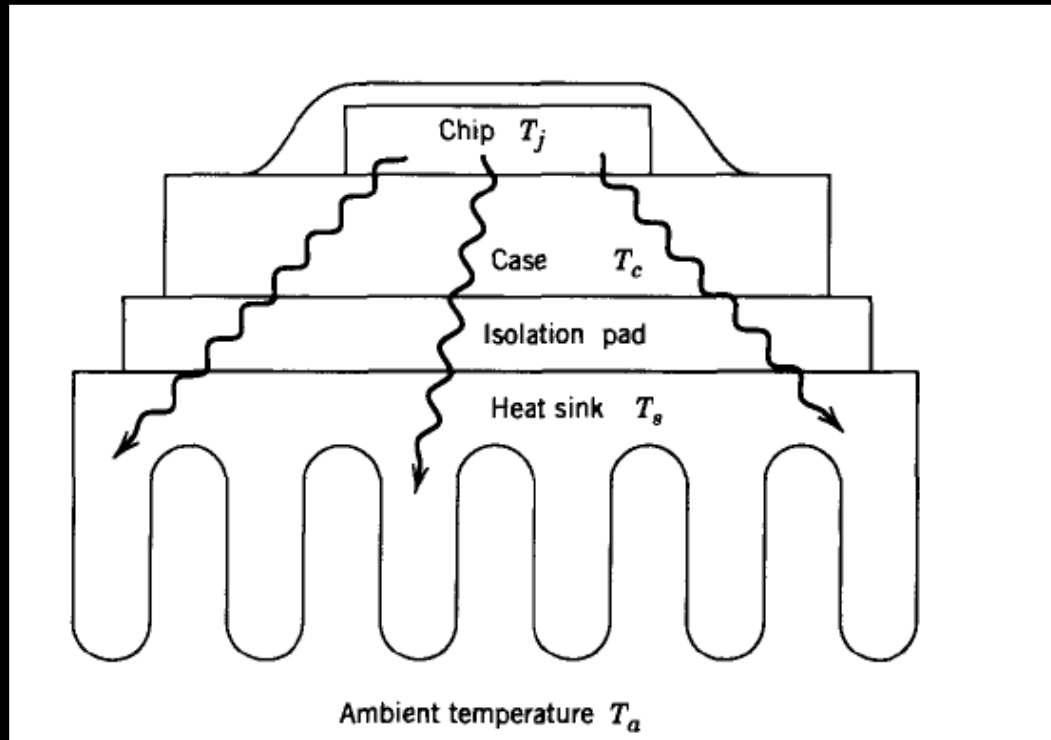

POWER ELECTRONIC

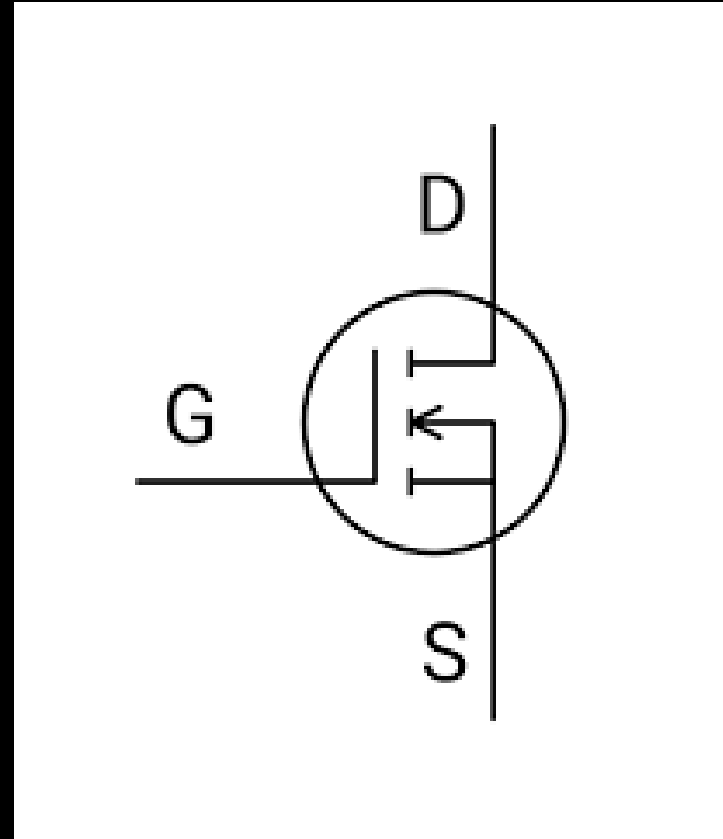
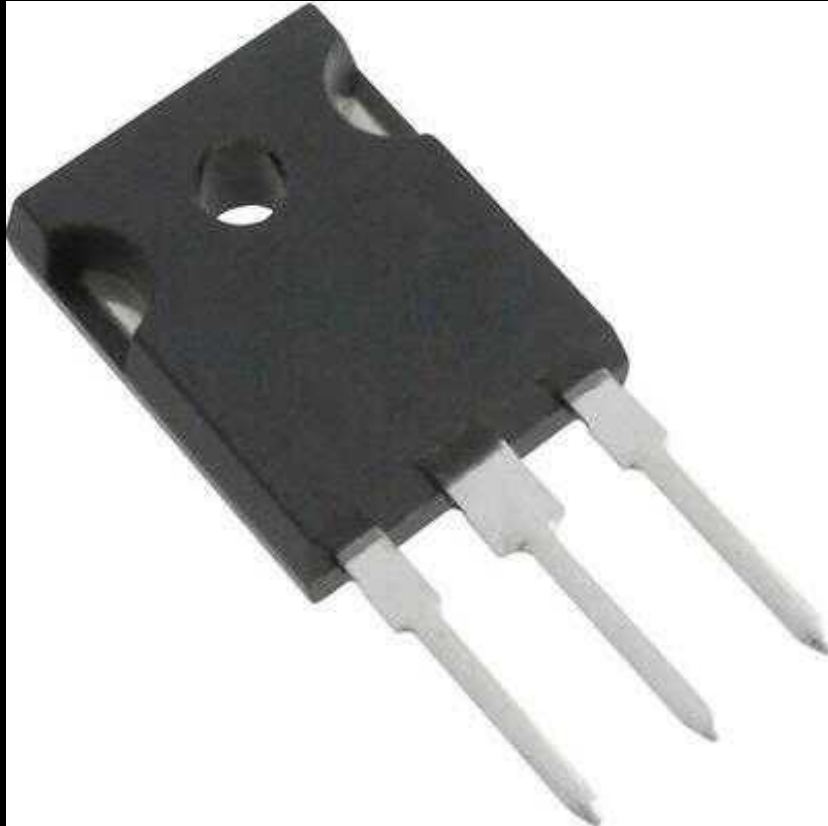
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2022, Istanbul

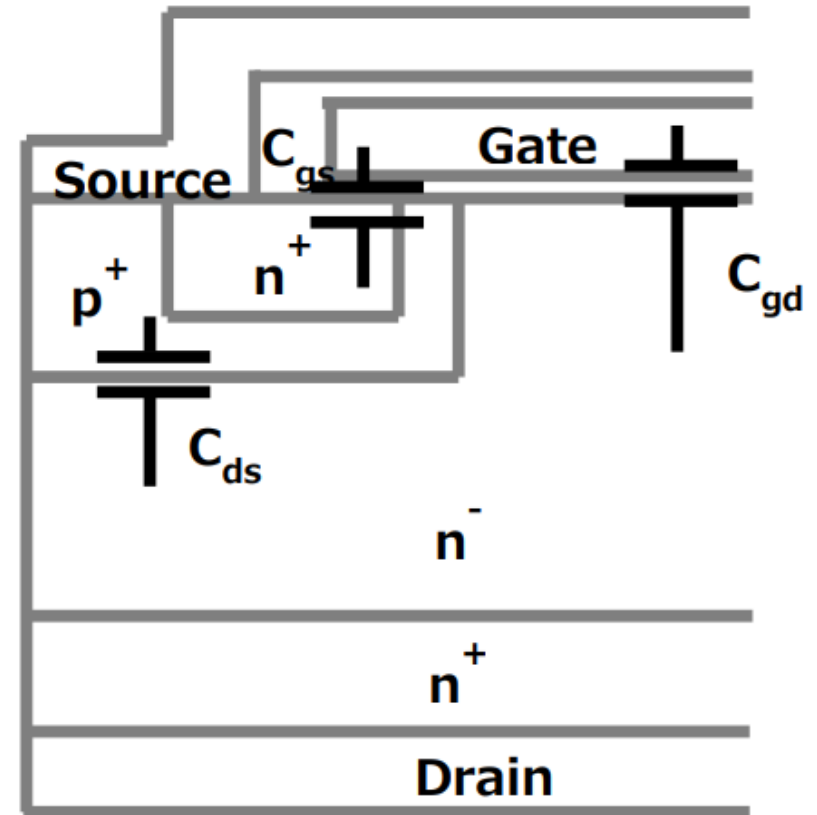
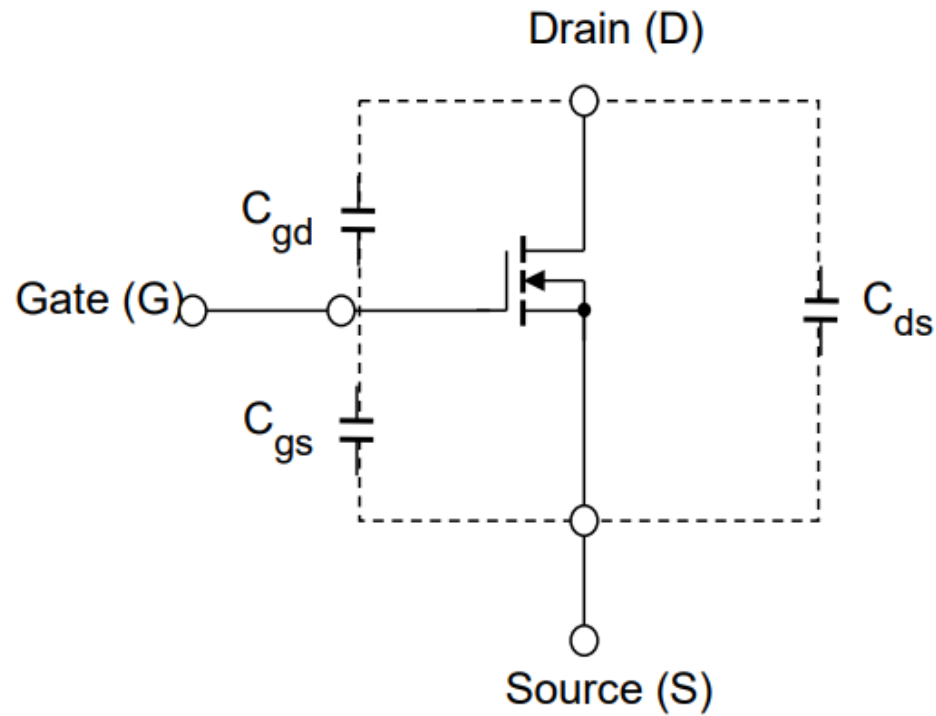
Power Losses



MOSFET



MOSFET

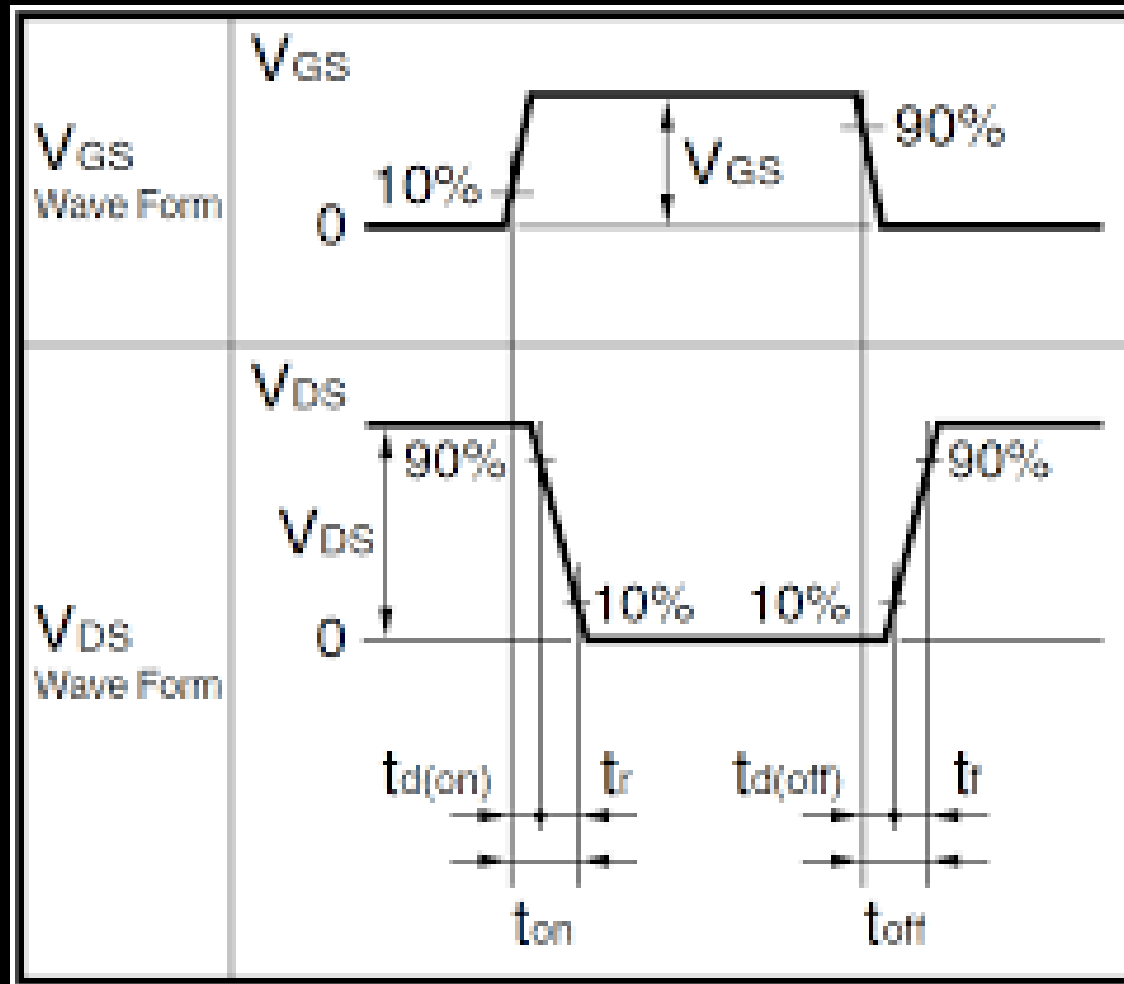


Input capacitance (C_{iss}) = $C_{gd} + C_{gs}$

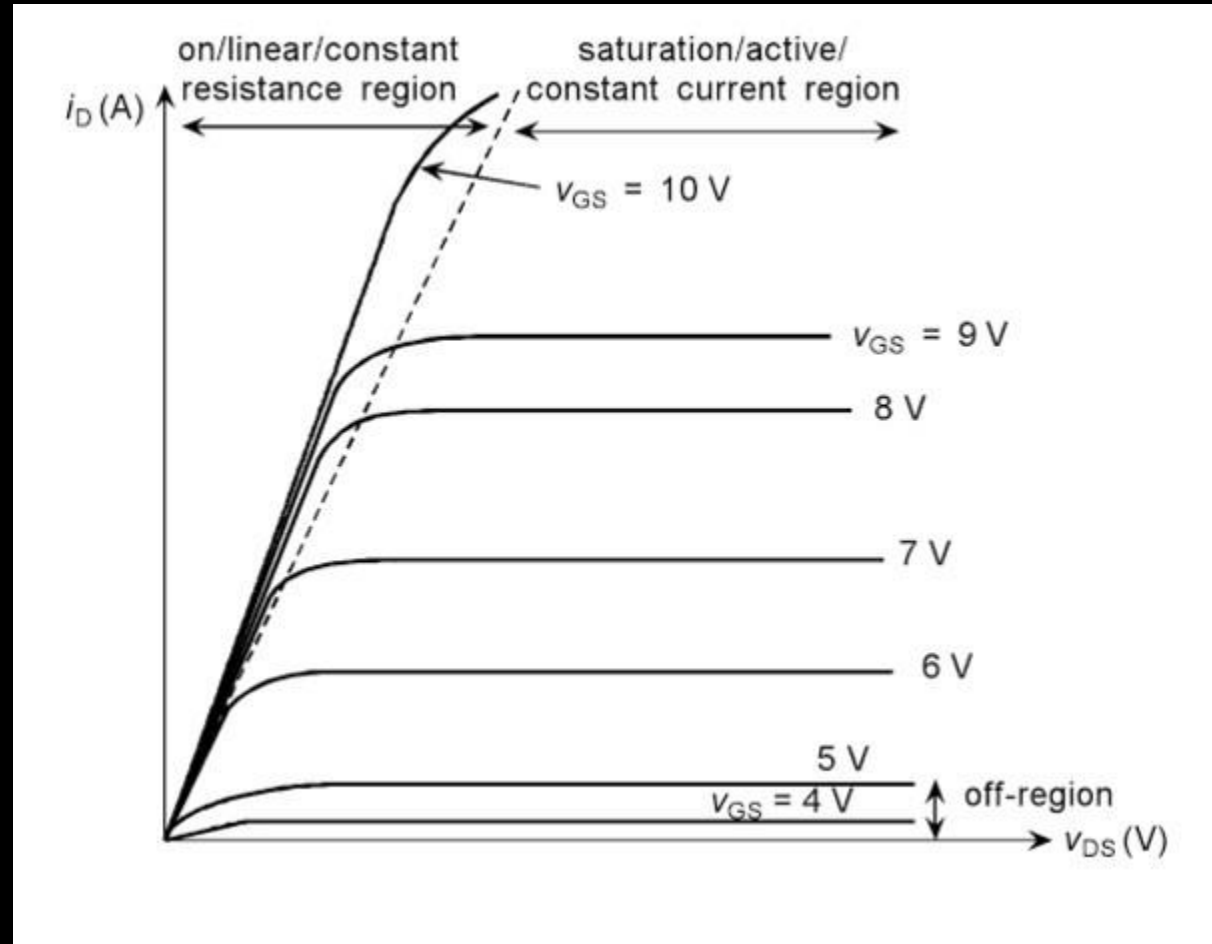
Output capacitance (C_{oss}) = $C_{ds} + C_{gd}$

Reverse transfer capacitance (C_{rss}) = C_{gd}

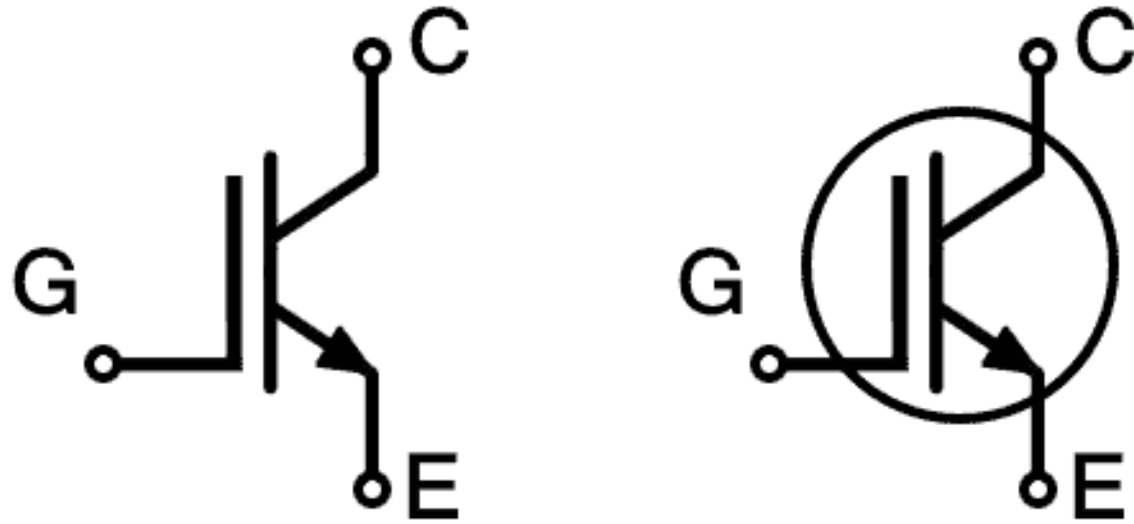
MOSFET



MOSFET

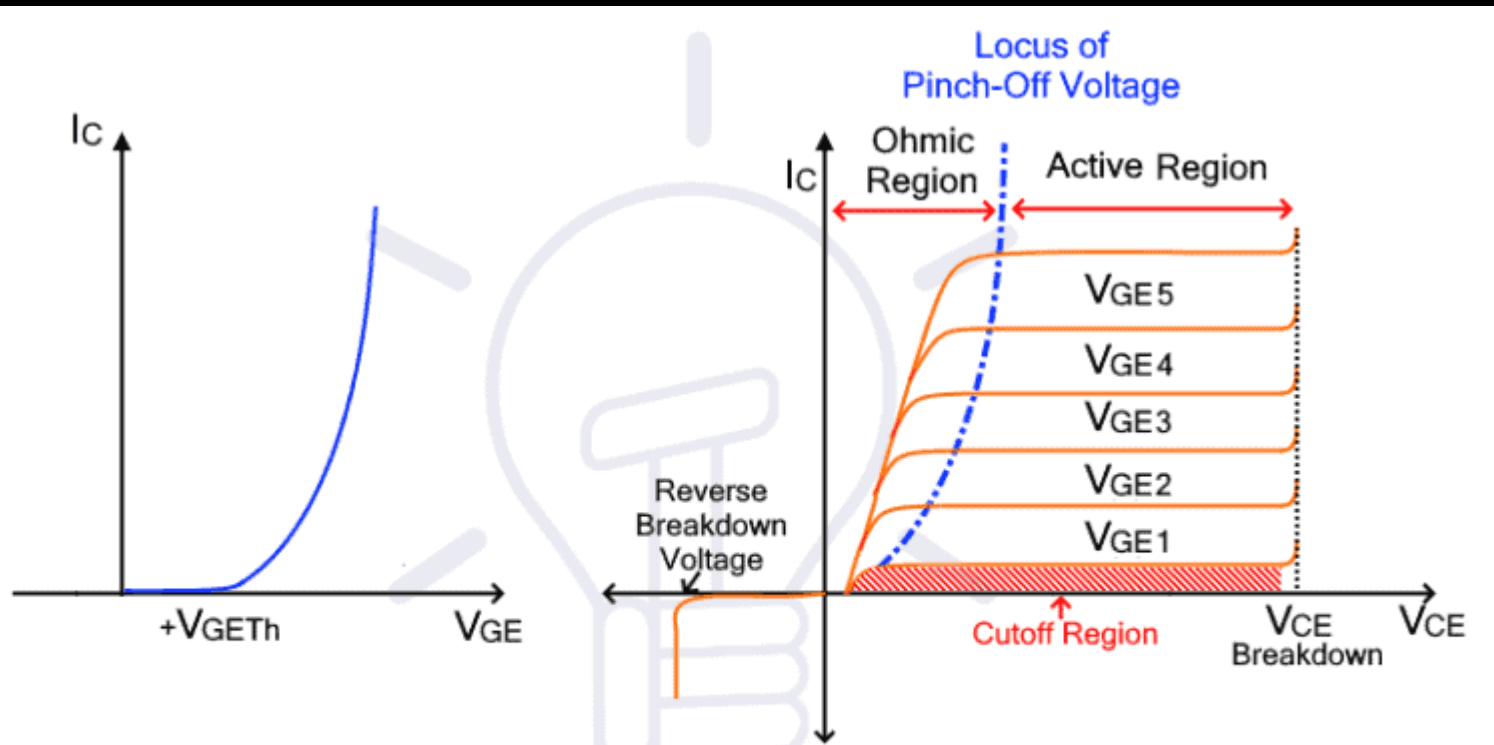


IGBT



IGBT - Insulated-Gate Bipolar Transistor
Symbol

IGBT



I-V Characteristics of IGBT

IGBT

Characteristic	Power BJT	Power MOSFET	IGBT
Voltage Rating	High < 1kV	High < 1kV	Very High > 1kV
Current Rating	High < 500 A	Low < 200 A	Very High > 500 A
Input Parameter	Base Current, I_b	Voltage, V_{GS}	Voltage, V_{GE}
Input Drive	Current gain (hfe)	Voltage, V_{GS}	Voltage, V_{GE}
	20-200	3-10V	4-8V
Input Drive Power	High	Low	Low
Input Drive Circuitry	Complex	Simple	Simple
Input Impedance	Low	High	High
Output Impedance	Low	Medium	Low
Switching Loss	High	Low	Medium
Switching Speed	Low	Fast	Medium
Cost	Low	Medium	High

