

































































































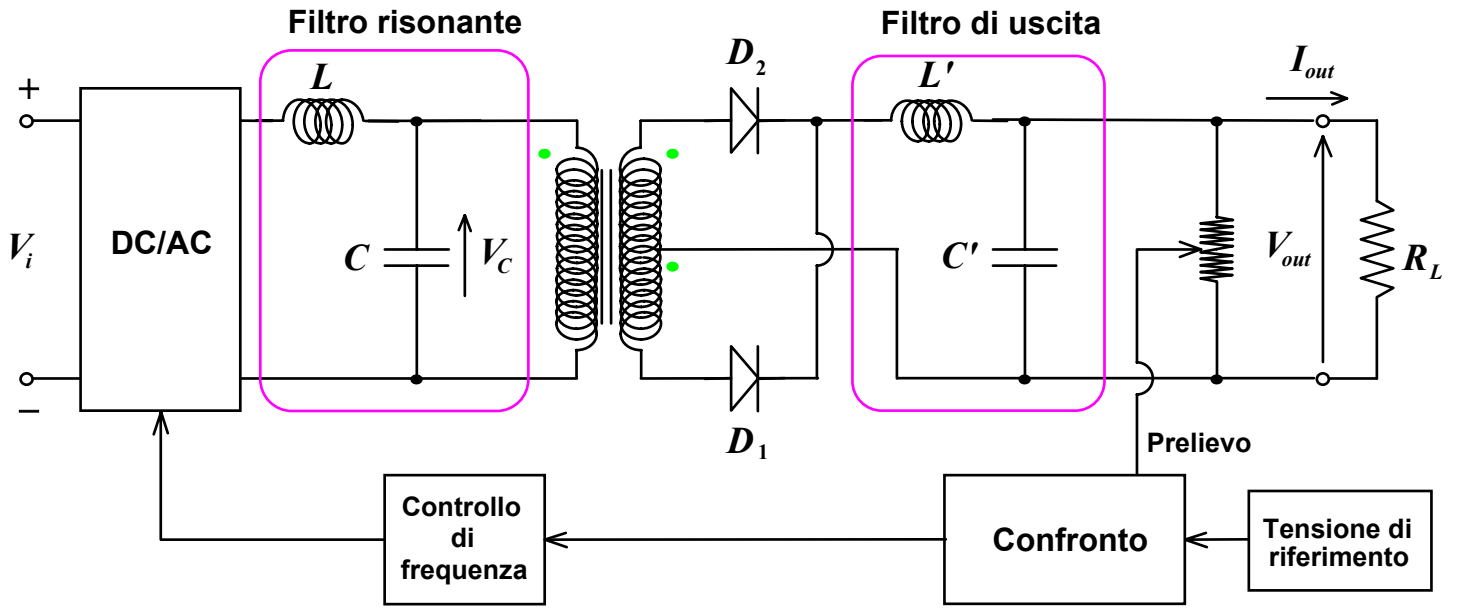






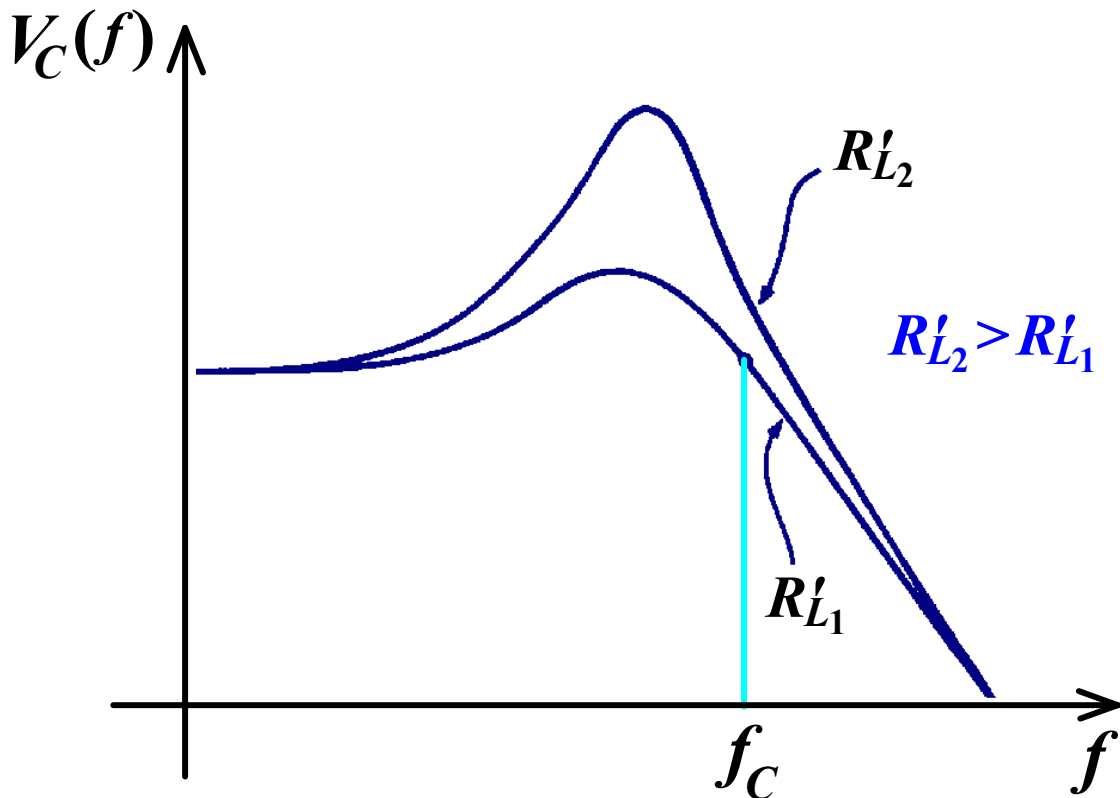


## Alimentatore a risonanza



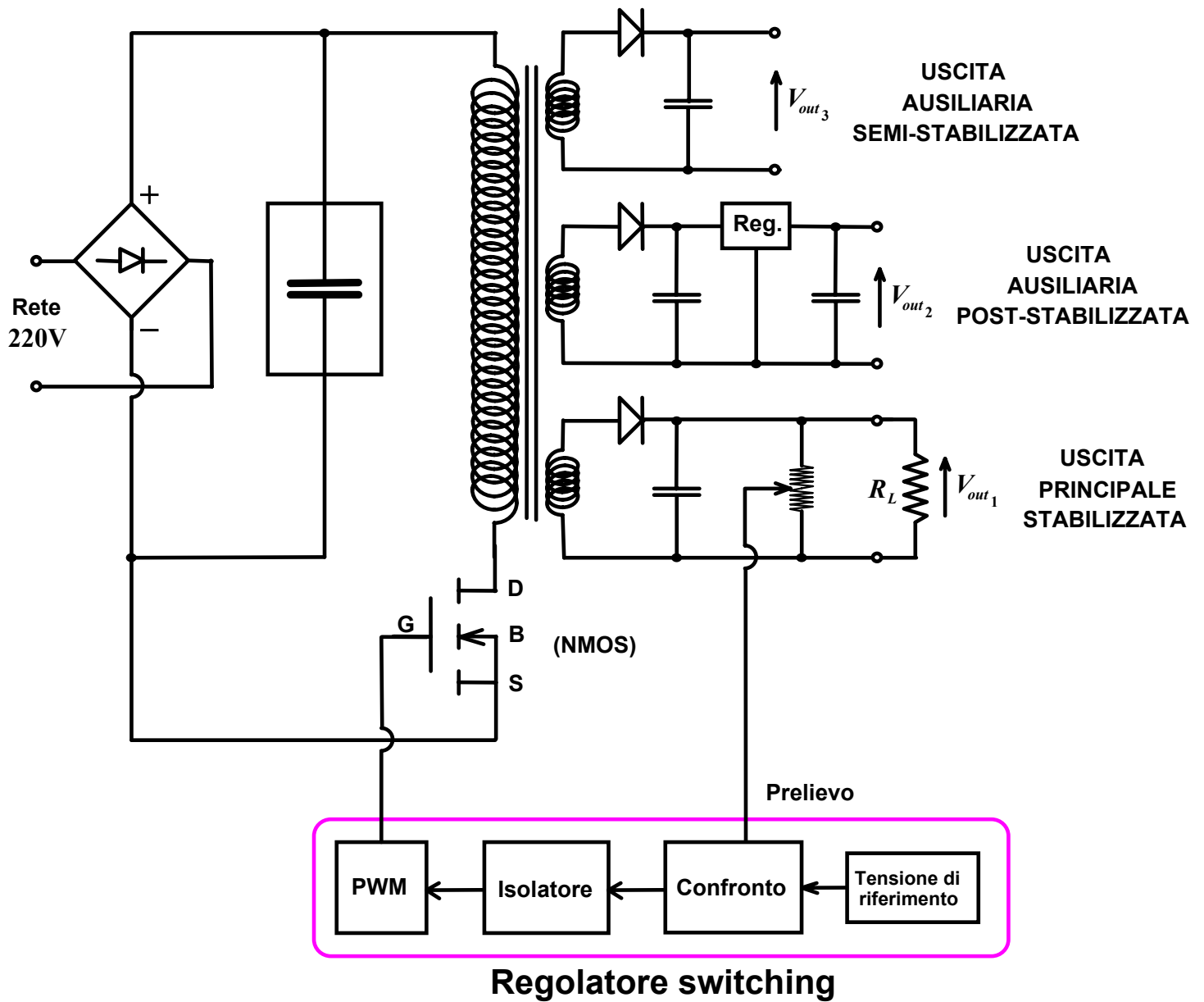
$L, C$  filtro risonante

$L', C'$  filtro di uscita





## SMPS con uscite multiple



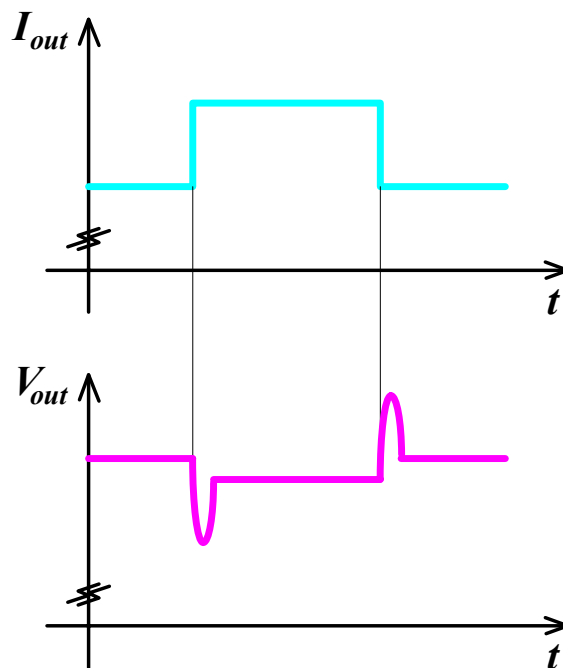
### Caratteristiche principali:

- buona regolazione nei confronti delle variazioni della tensione di rete;
- variazioni della tensione sulle uscite ausiliarie a seguito di variazioni di carico sull'uscita principale (effetto della cross-regulation).

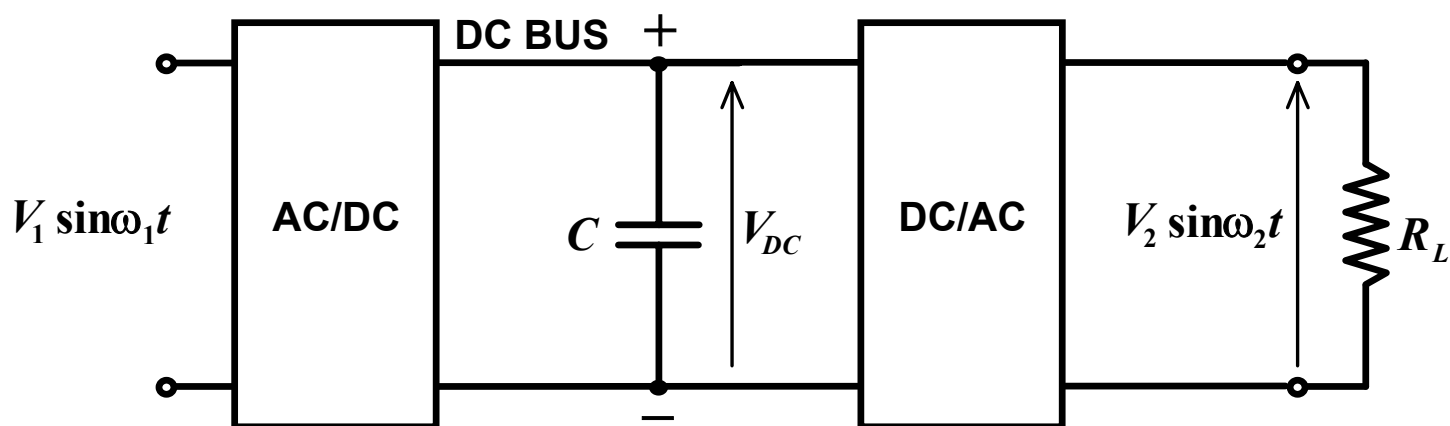
## Risposta ai transitori

### Tecniche utilizzate

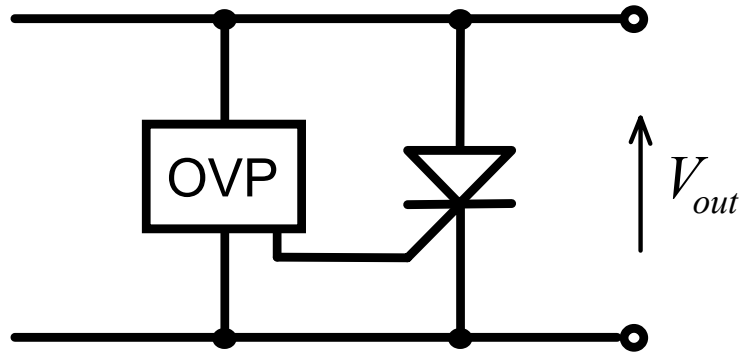
- *Feedforward*
- *Current mode*
- *Soft start*



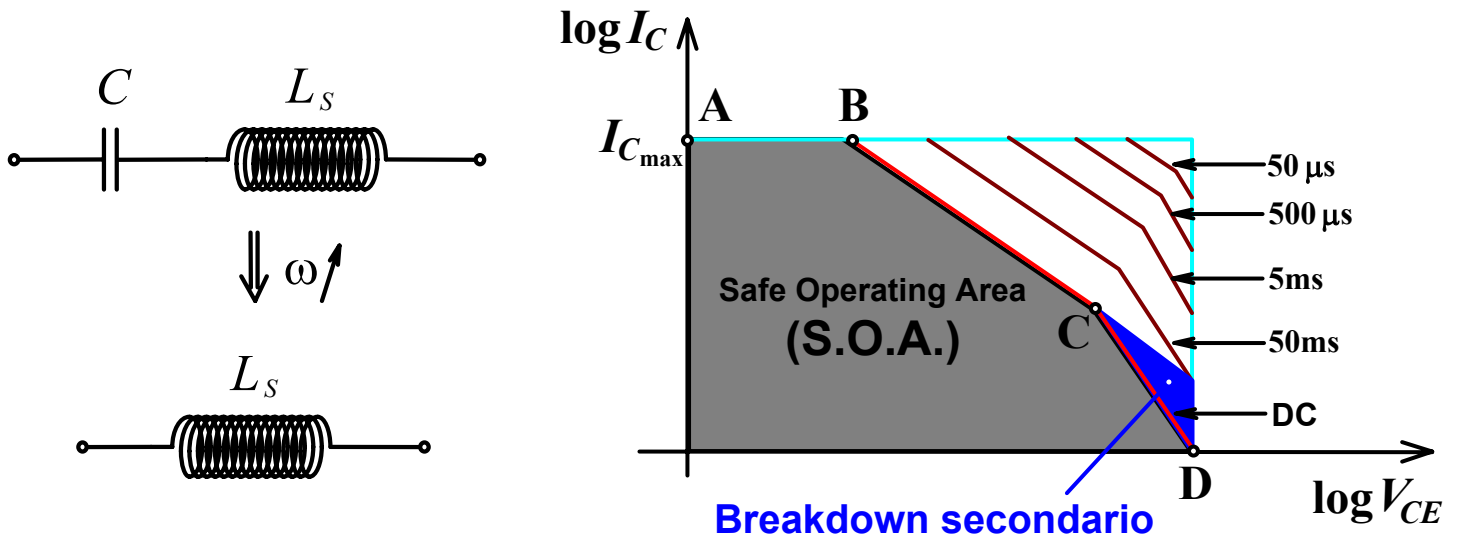
## UPS (Uninterruptible Power Supply)



**OVP**  
(Over Voltage Protection)



*Scelta dei dispositivi passivi ed attivi*

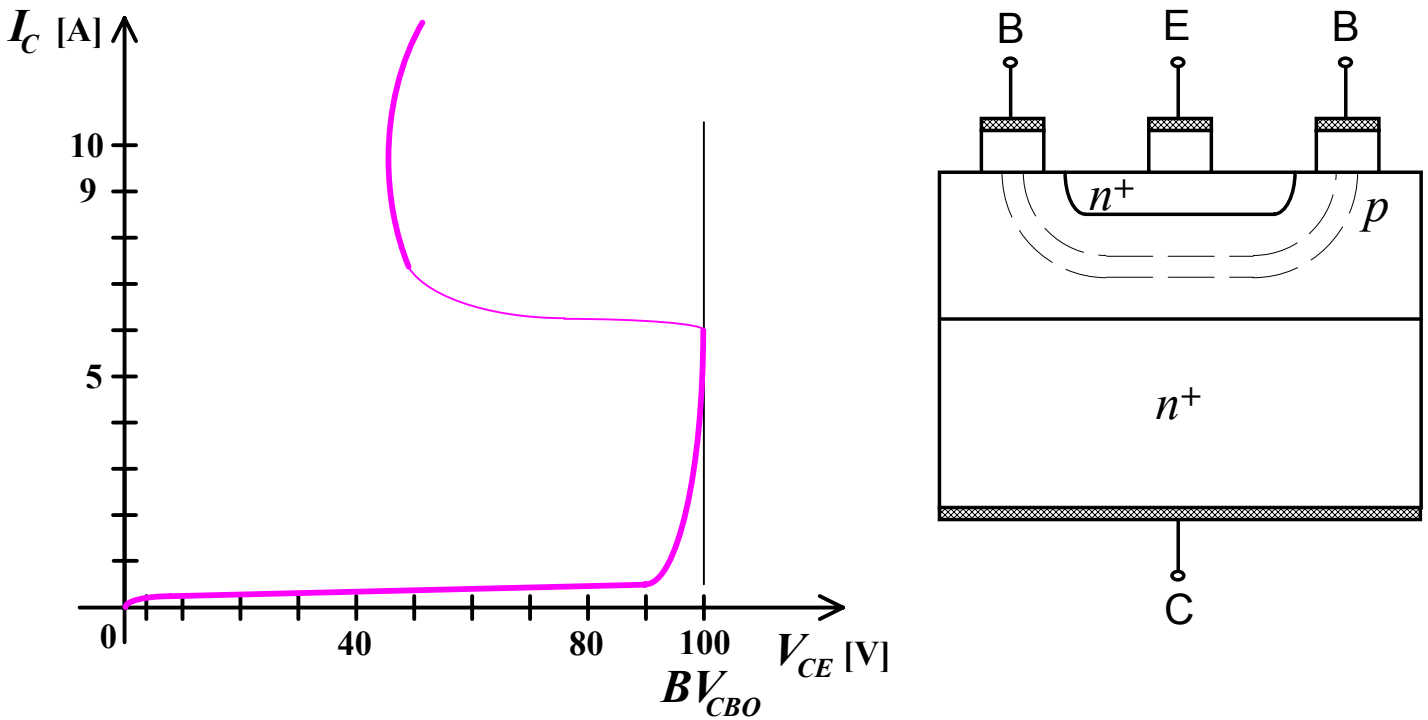


*Parametri di interesse:*

*ESR=Equivalent Series Resistance*

*ESL=Equivalent Series Inductance*

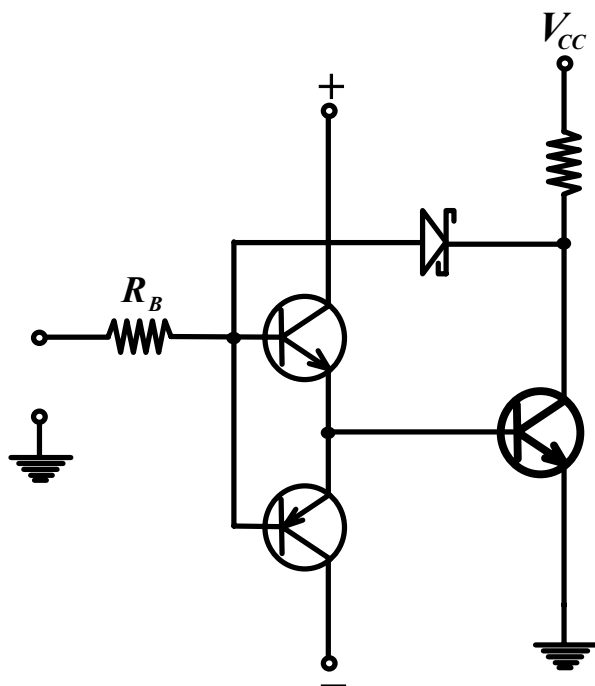
## Breakdown secondario



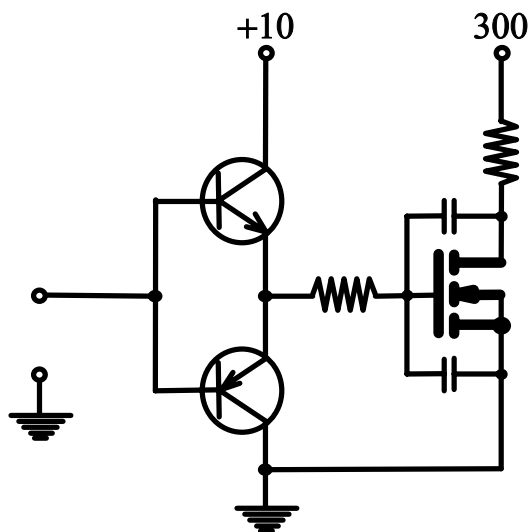
Per evitare l'effetto di **focalizzazione della corrente** le connessioni interne della base e dell'emettitore sono fatte a pettine interdigitale.

## Circuiti di pilotaggio

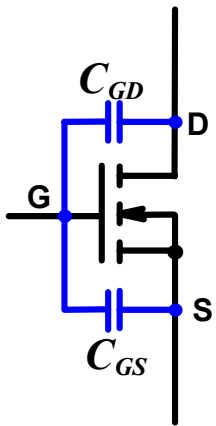
pilotaggio di BJT



pilotaggio di MOSFET



### Esempio numerico



$$C_{GD} = 50 \text{ pF}$$

$$C_{GS} = 500 \text{ pF}$$

$$\begin{aligned} \Delta Q &= C_{GS} \Delta V_{GS} + C_{GD} \Delta V_{DG} \\ &= 500 \cdot 10^{-12} \cdot 10 + 50 \cdot 10^{-12} \cdot 290 \cong \\ &\cong 20 \cdot 10^{-9} = 20 \text{ nC} \end{aligned}$$

$$I = \frac{\Delta Q}{\Delta t} = \frac{20 \cdot 10^{-9}}{100 \cdot 10^{-9}} = \mathbf{200 \text{ mA}}$$

### IGBT (Insulated Gate Bipolar Transistor)

**Caratteristiche principali:**  $V_{CE}$  bassa, pilotaggio di MOS, lento ON → OFF