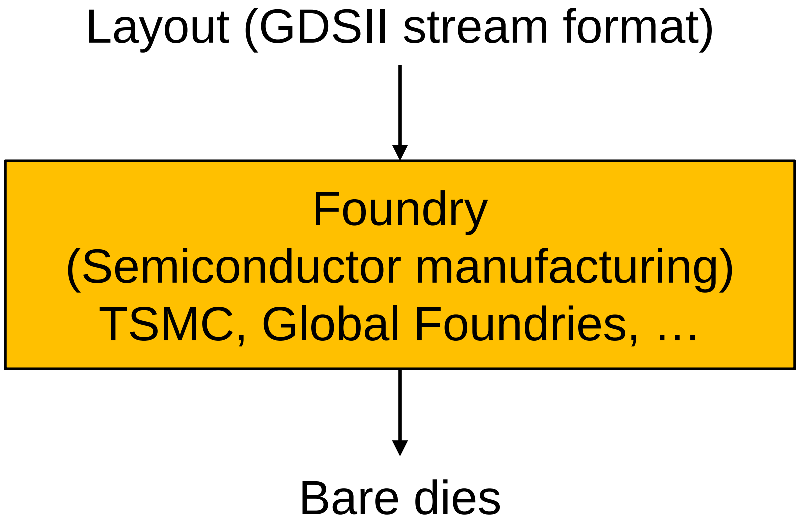
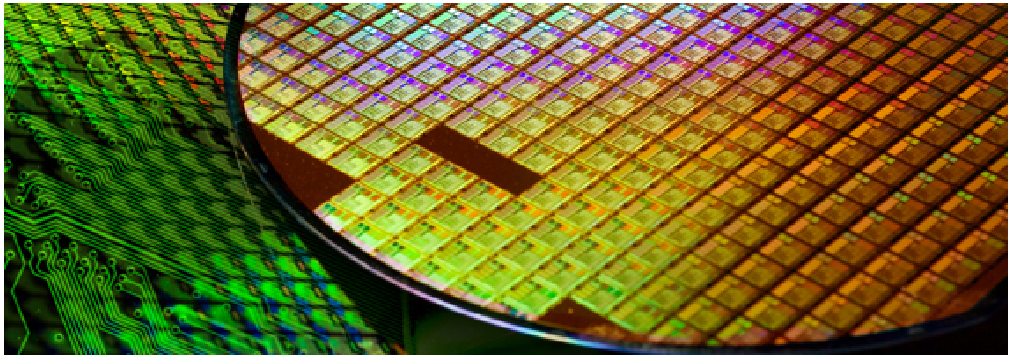
Semiconductor Manufacturing



Layout (GDSII stream format)

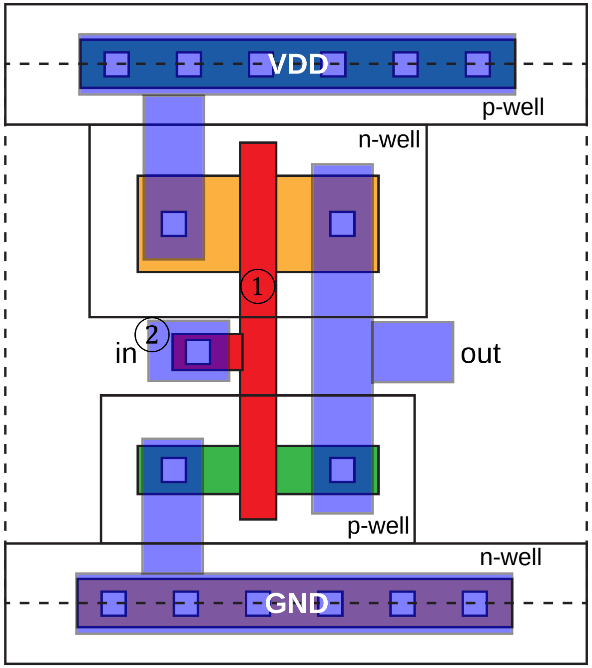
Foundry
(Semiconductor manufacturing)
TSMC, Global Foundries, …

Bare dies



Semiconductor Manufacturing

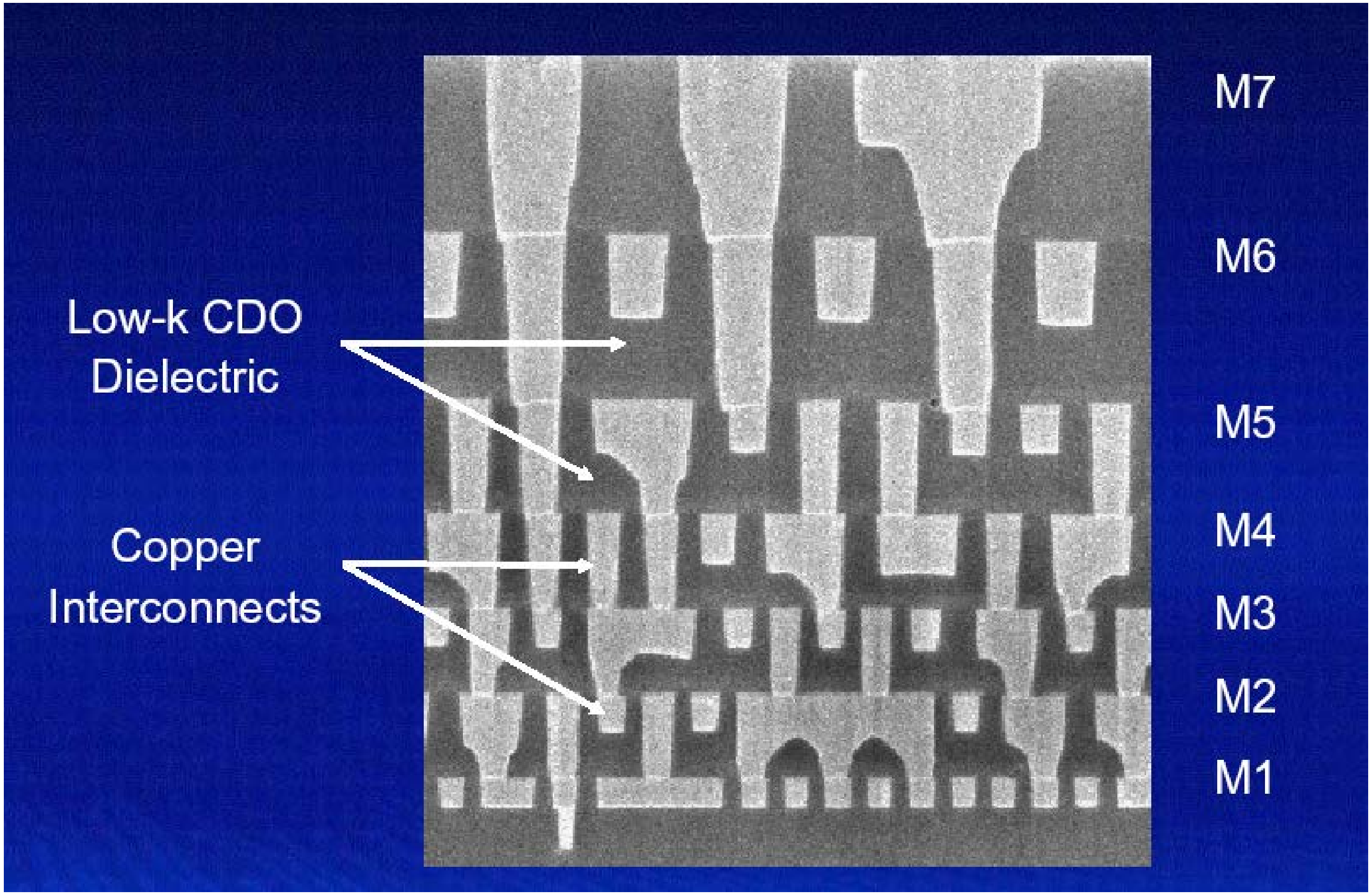
- Input
  - Layout (GDSII stream format)
    - A set of geometric objects



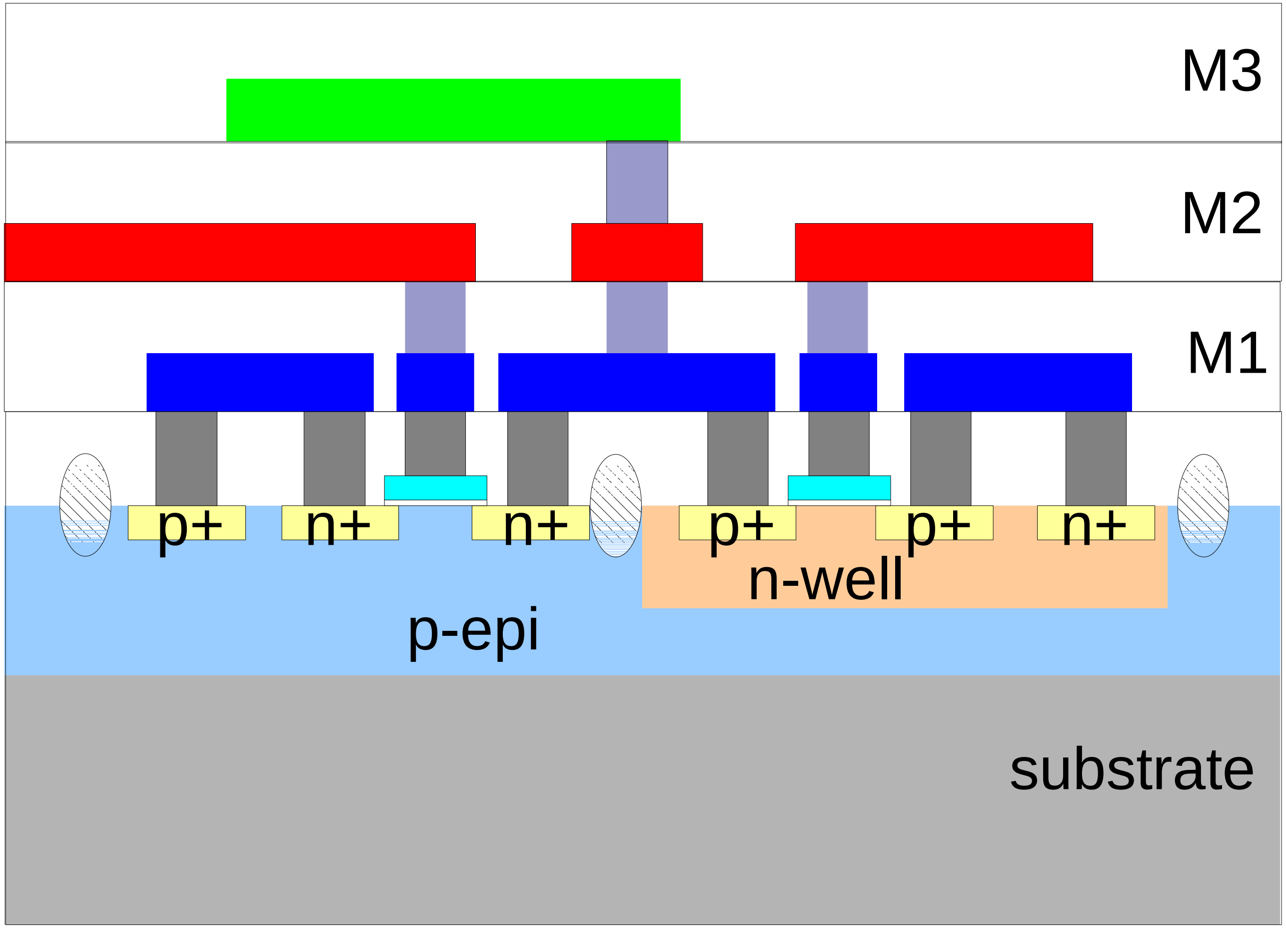
①: Layer id 3, polygon { 50, 40, 70, 40, 70, 220, 50, 220, 50, 140, 20, 140, 20, 110, 50, 110, 50, 40 }

②: Layer id 7, rectangle { 10, 105, 40, 150 }

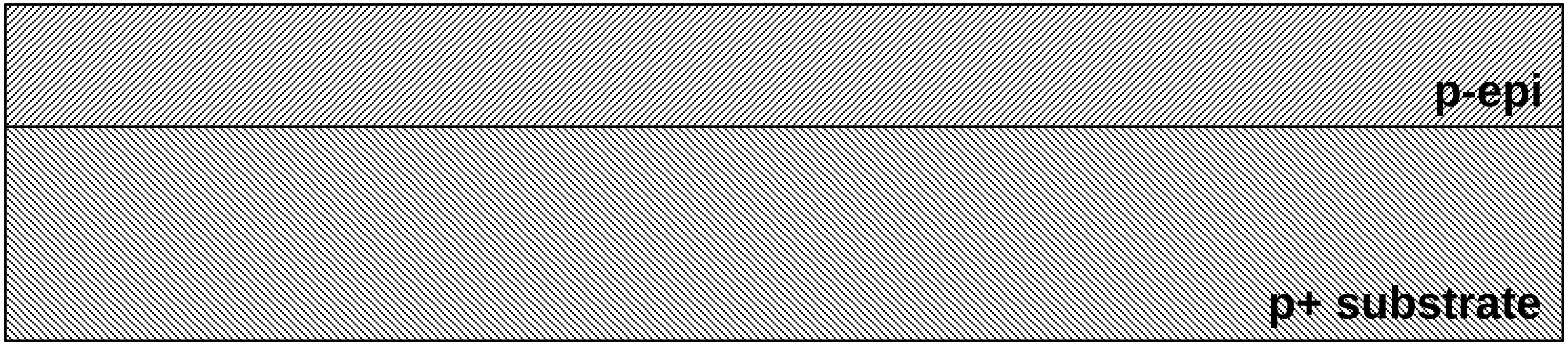
Semiconductor Manufacturing



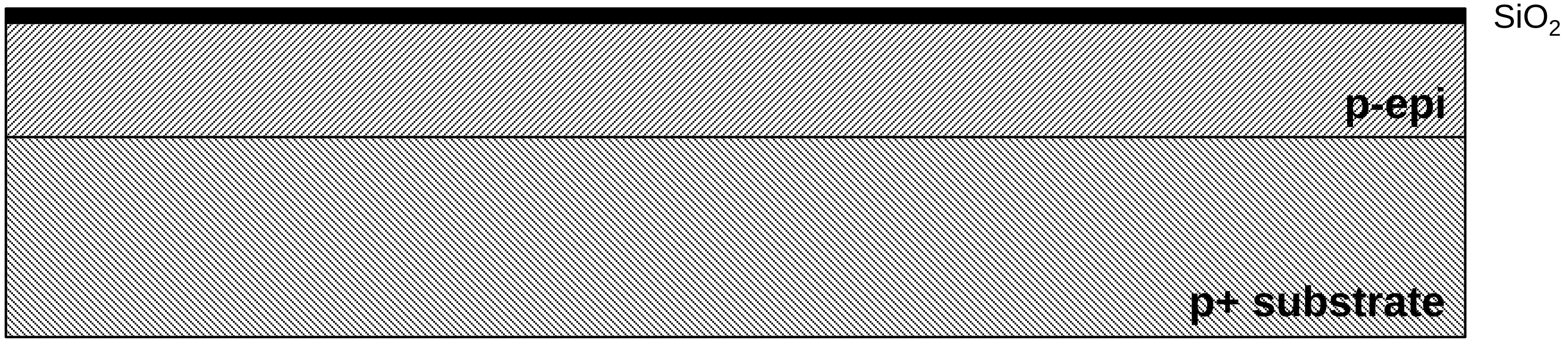
Semiconductor Manufacturing



Semiconductor Manufacturing

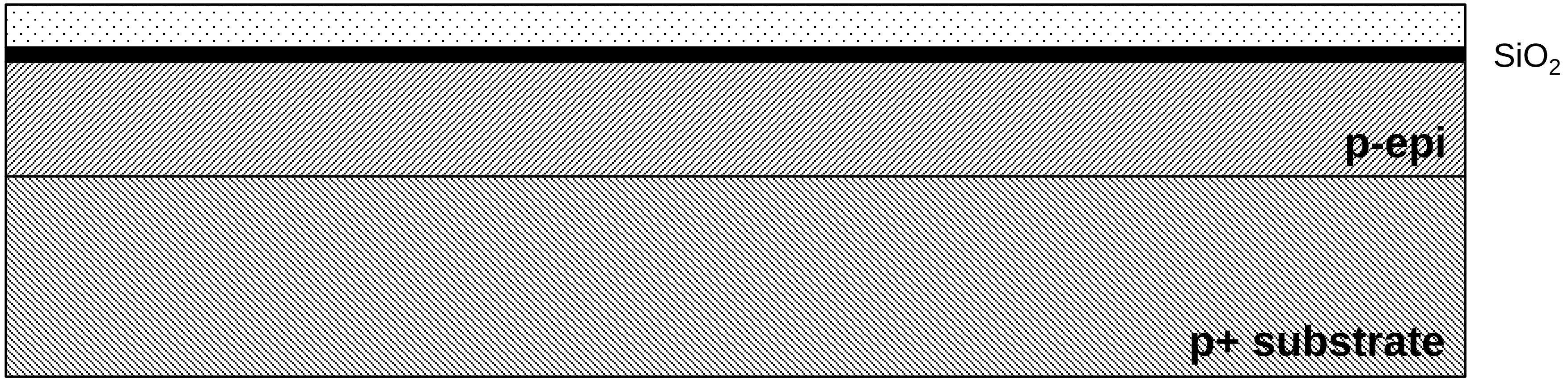


Semiconductor Manufacturing



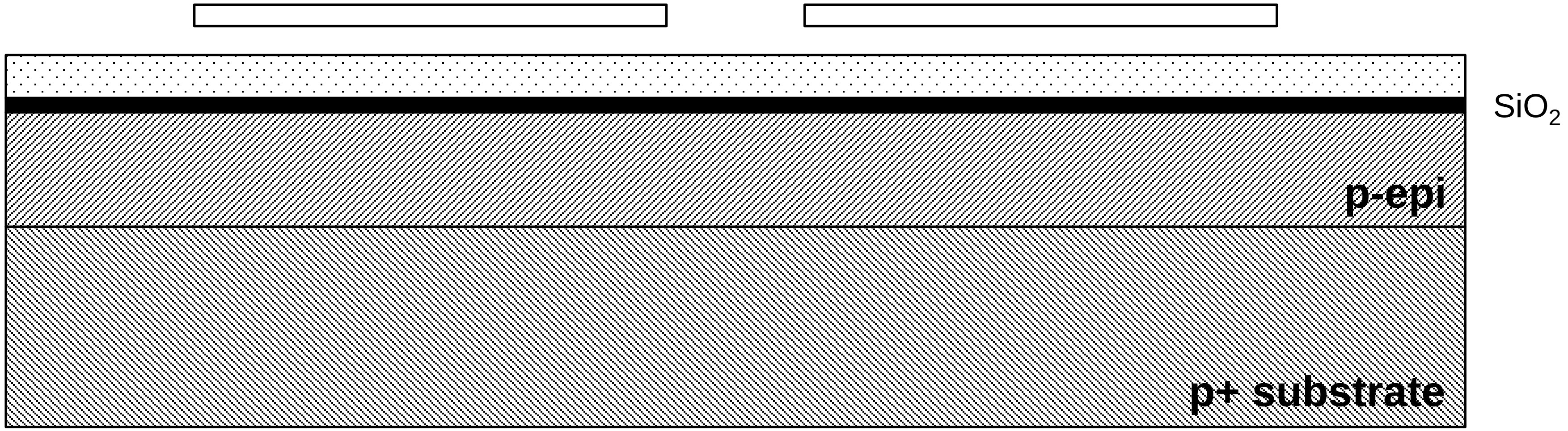
Gate-oxide deposition

Semiconductor Manufacturing



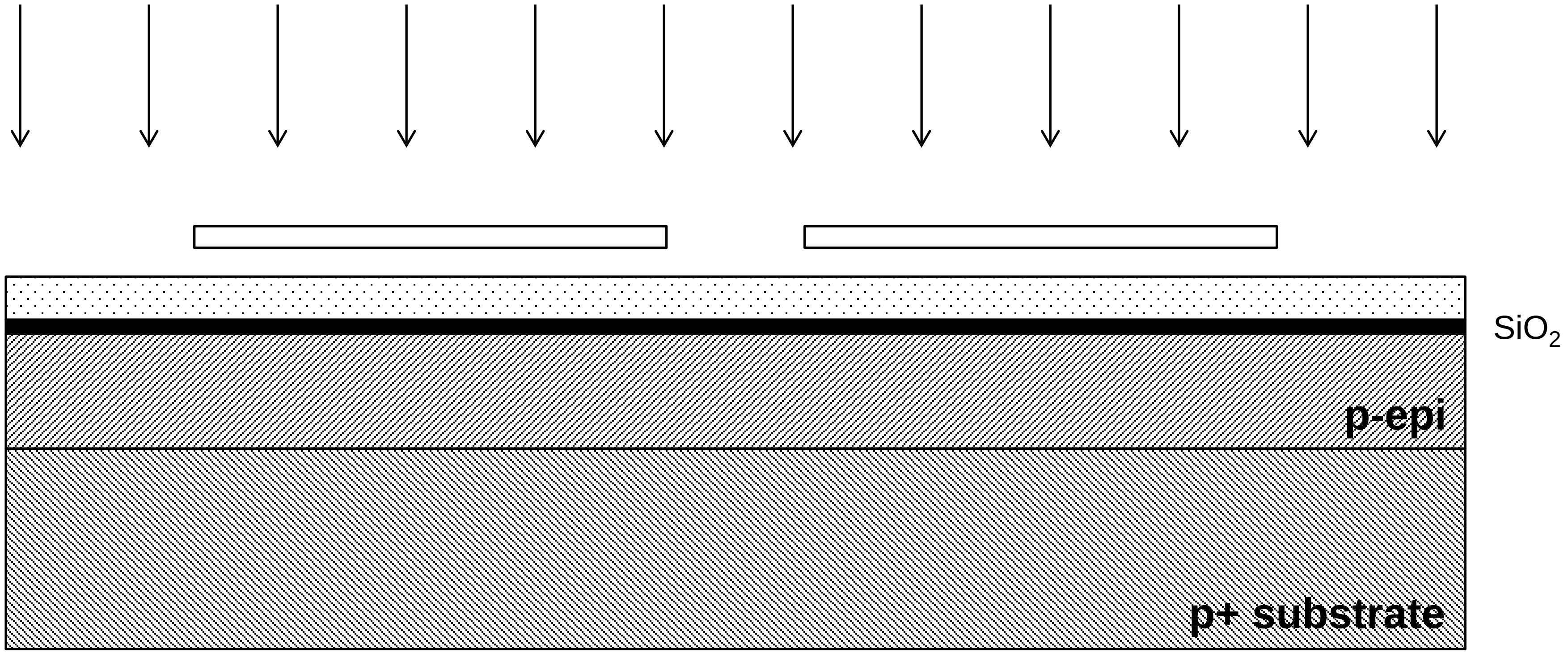
Photoresist

Semiconductor Manufacturing



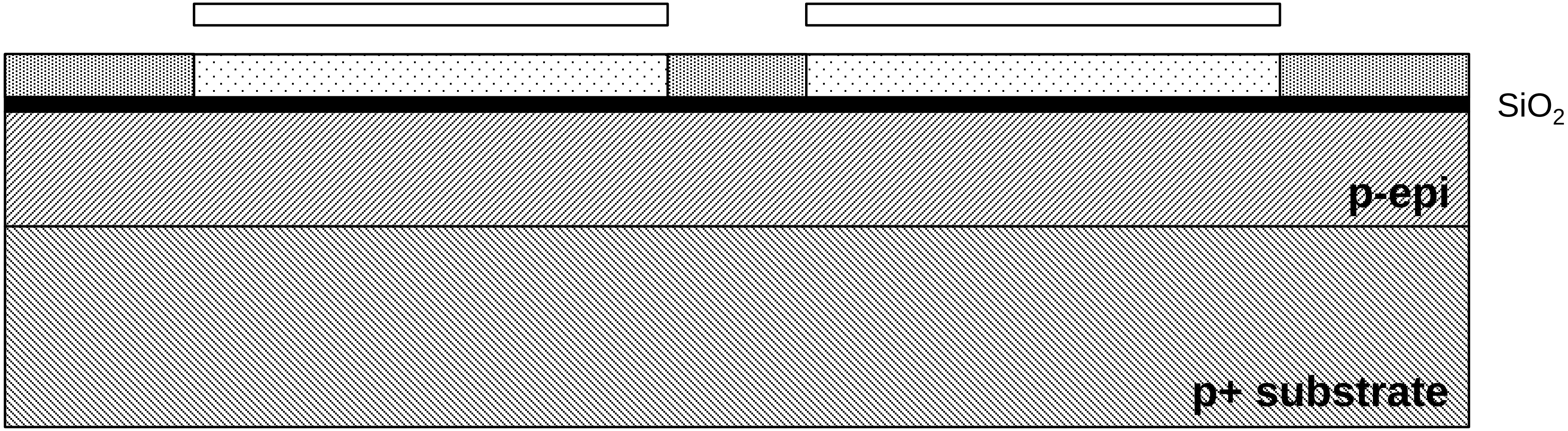
Mask

Semiconductor Manufacturing



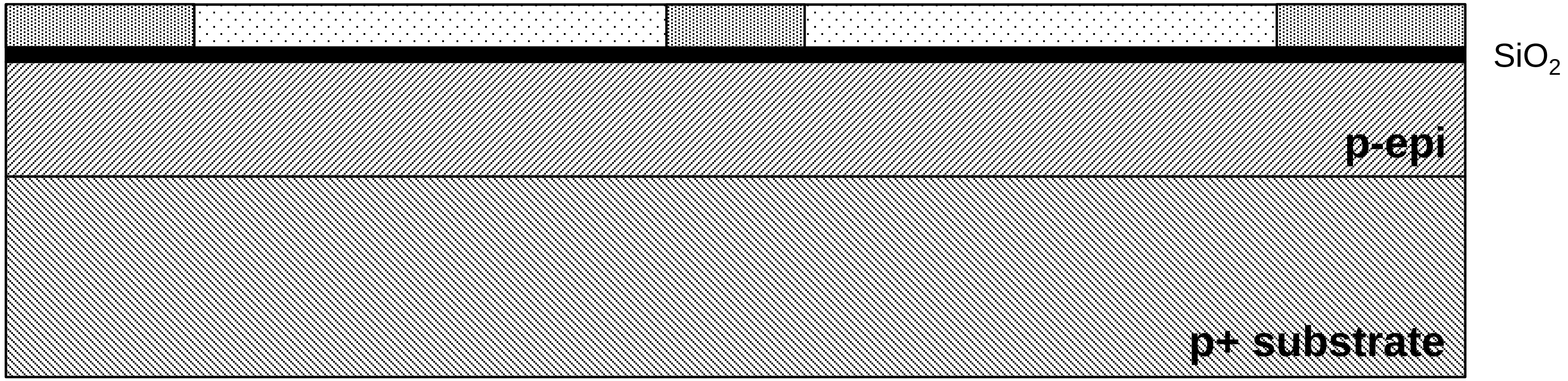
Expose (photolithography)

Semiconductor Manufacturing



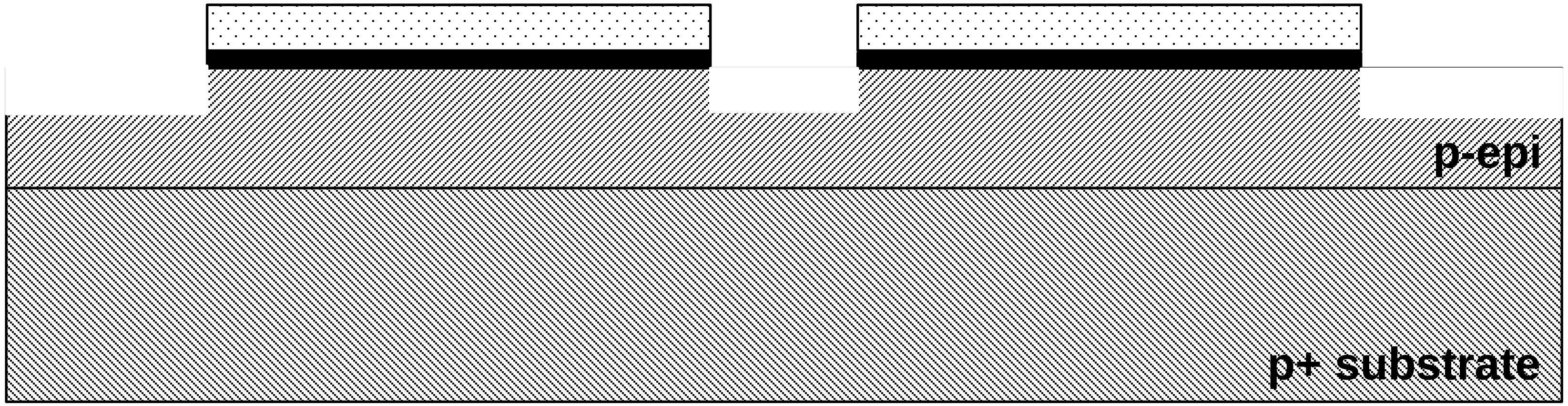
After photolithography

Semiconductor Manufacturing



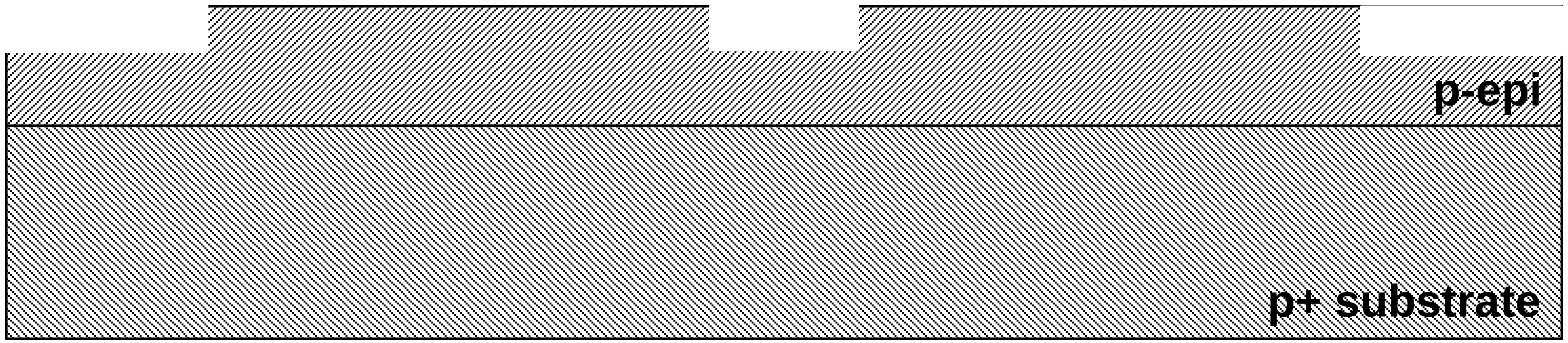
Remove mask

Semiconductor Manufacturing



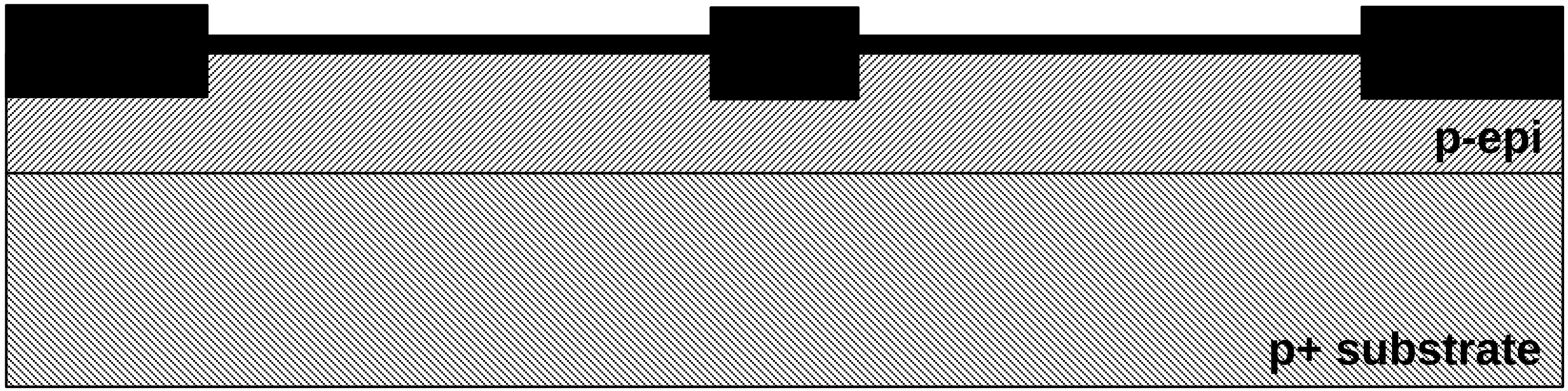
Etching

Semiconductor Manufacturing



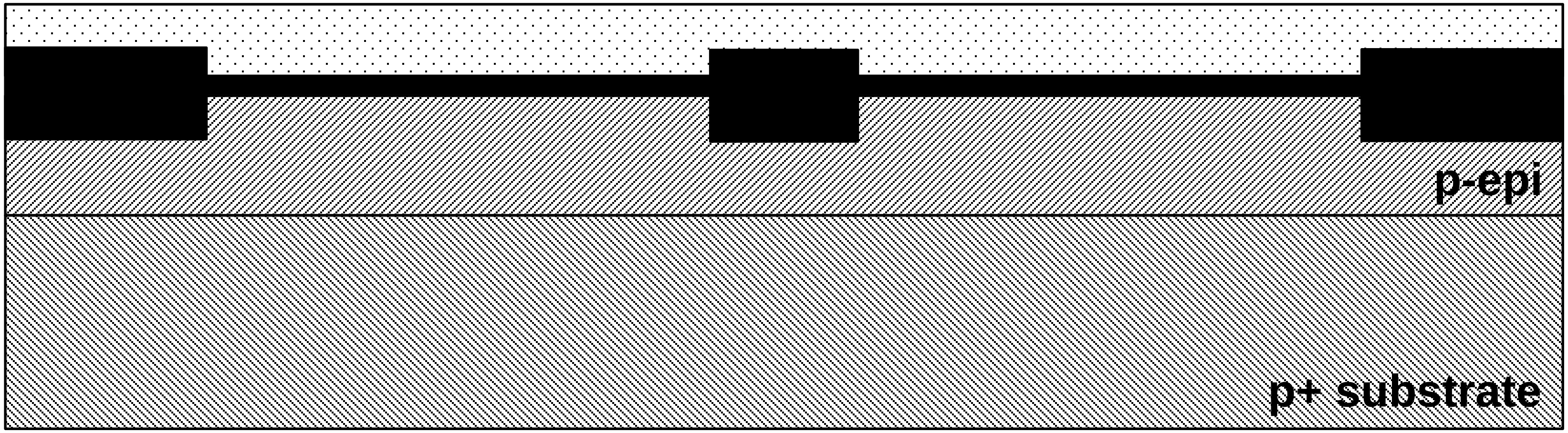
Etching

Semiconductor Manufacturing



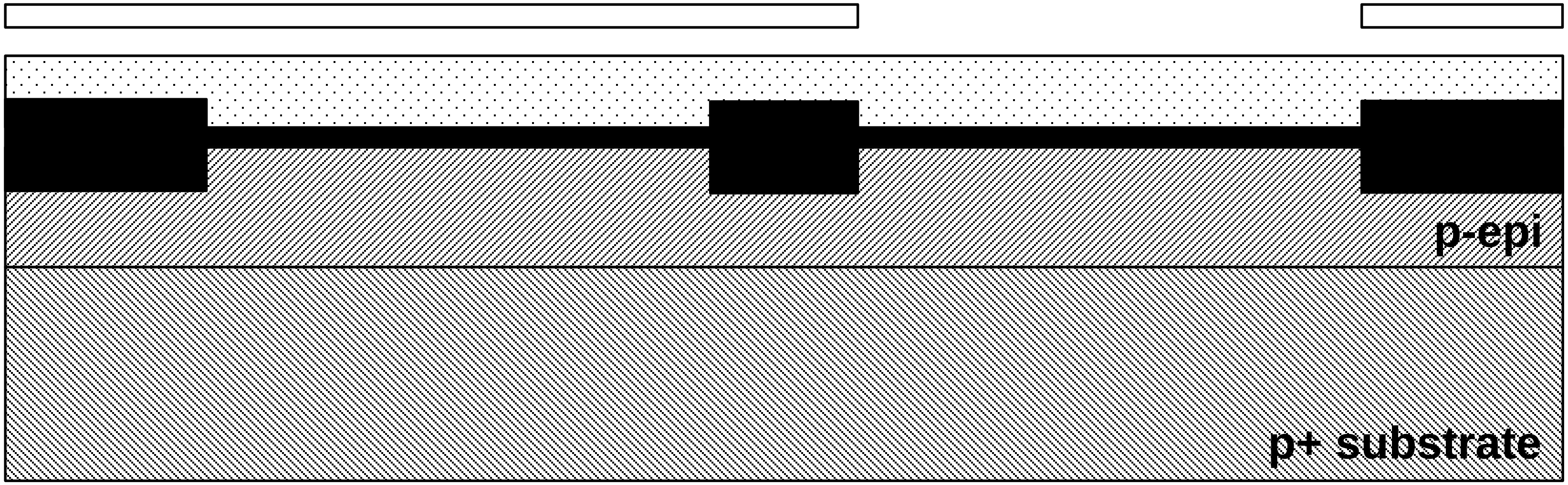
Oxide deposition

Semiconductor Manufacturing



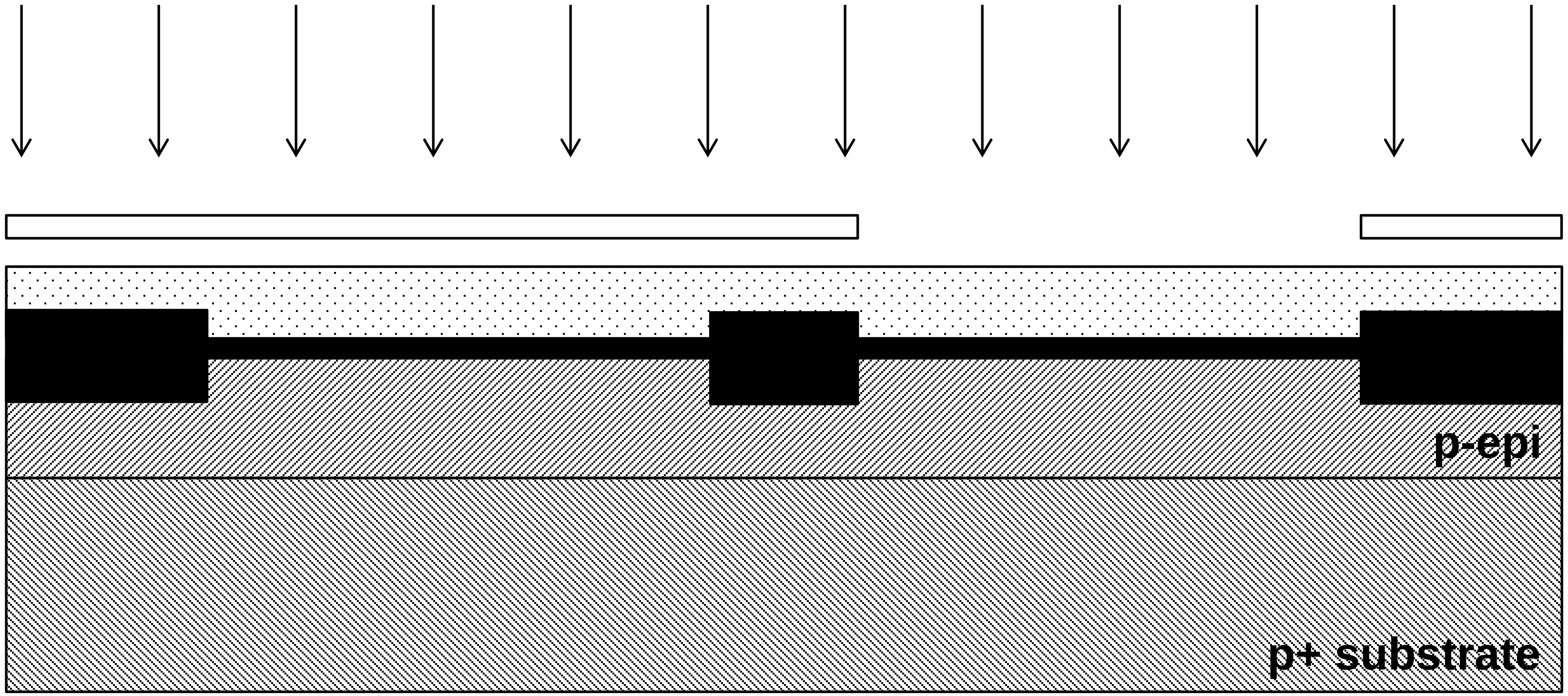
Photoresist

Semiconductor Manufacturing



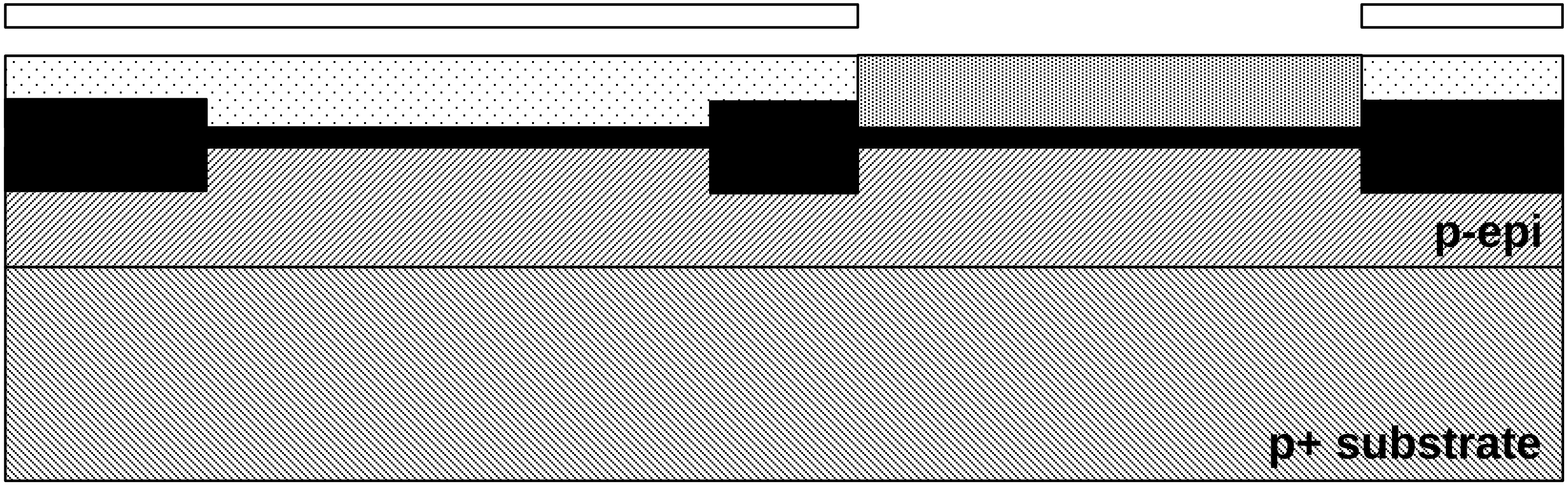
Mask

Semiconductor Manufacturing



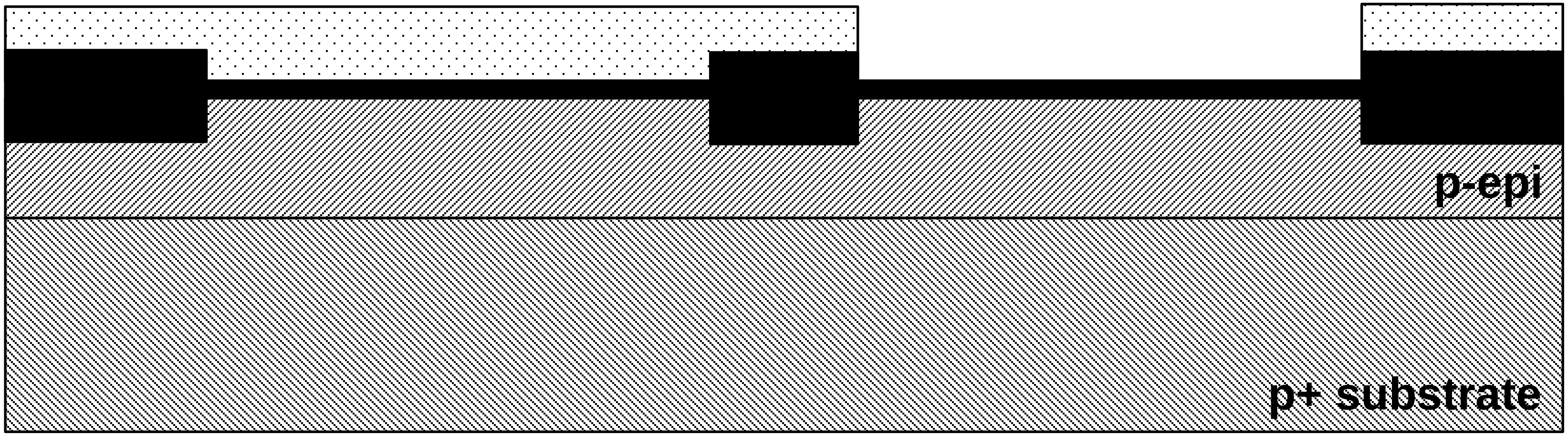
Photolithography

Semiconductor Manufacturing



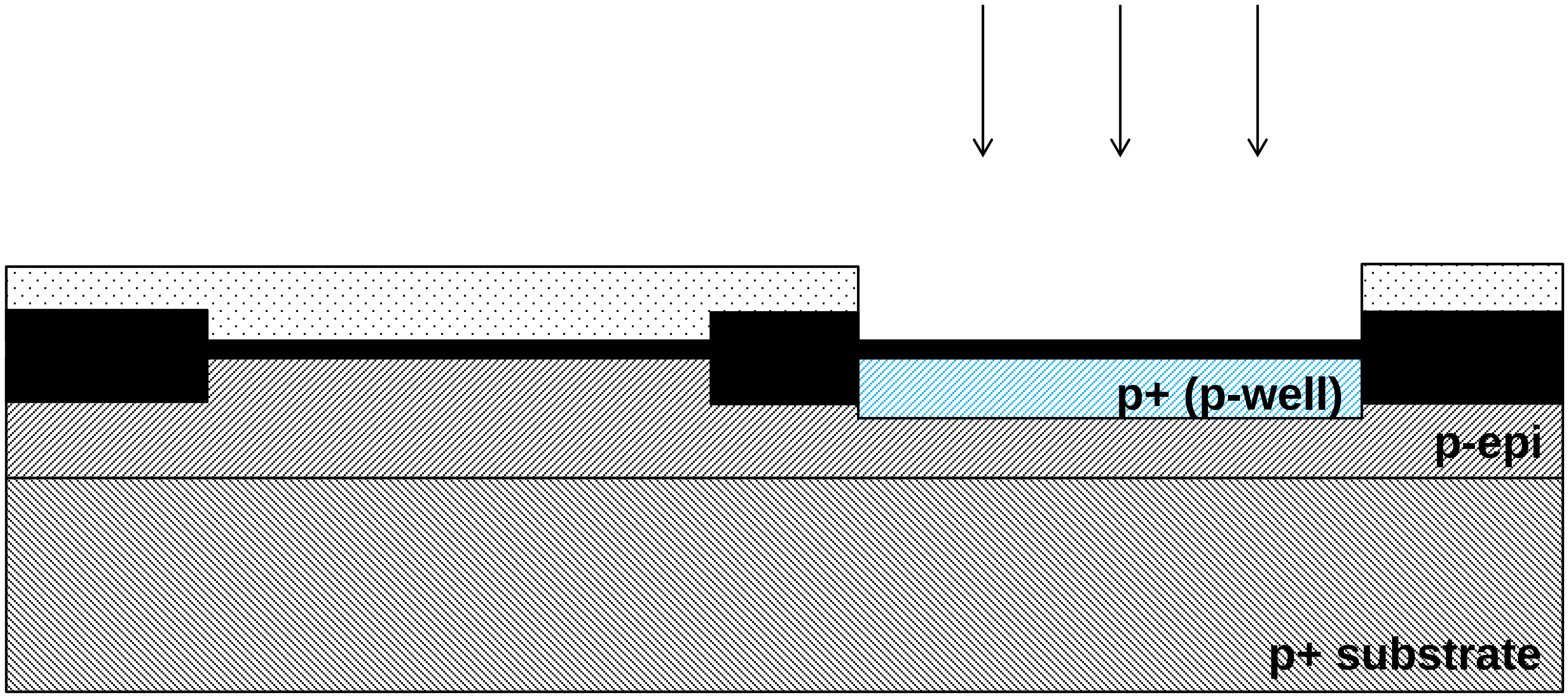
After photolithography

Semiconductor Manufacturing



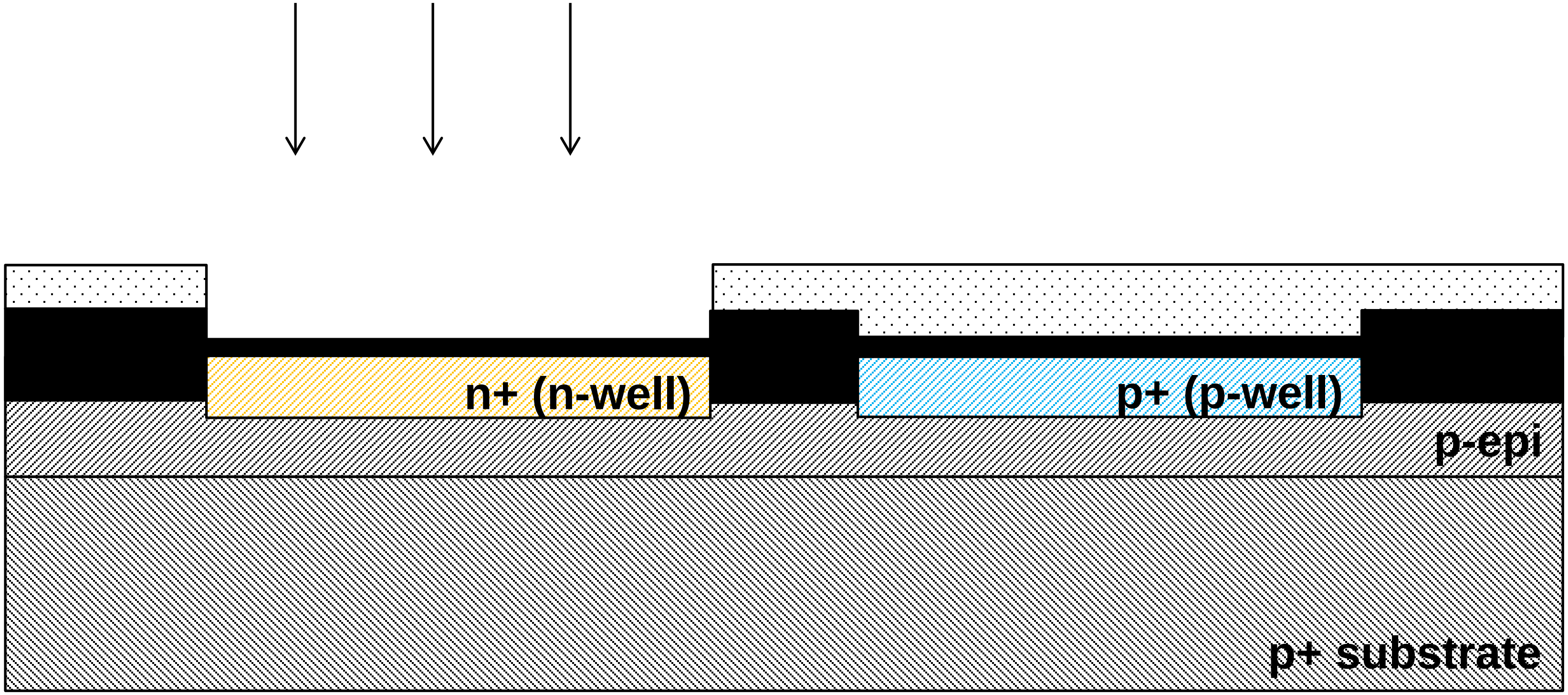
Etch

Semiconductor Manufacturing



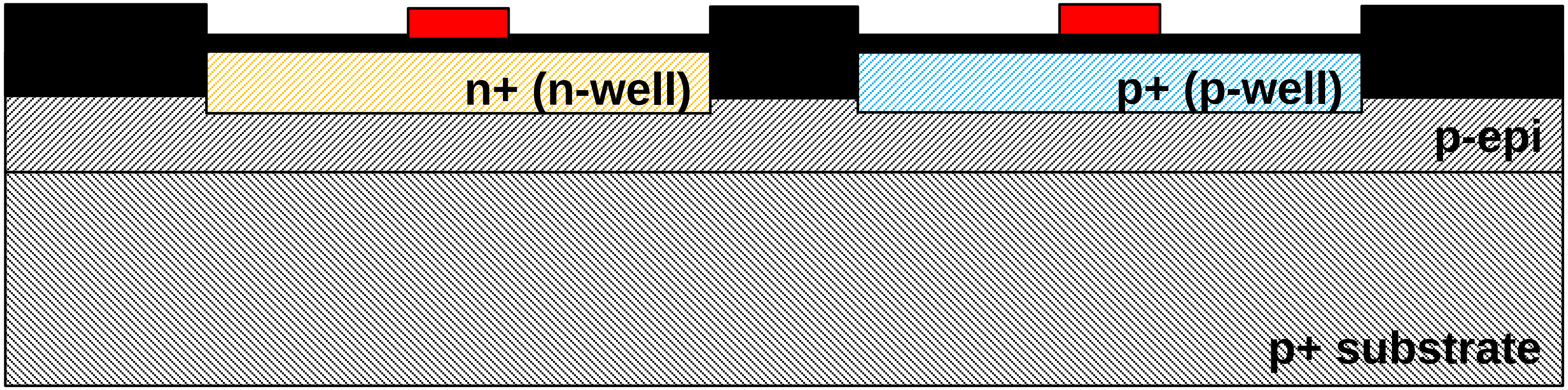
Doping

Semiconductor Manufacturing



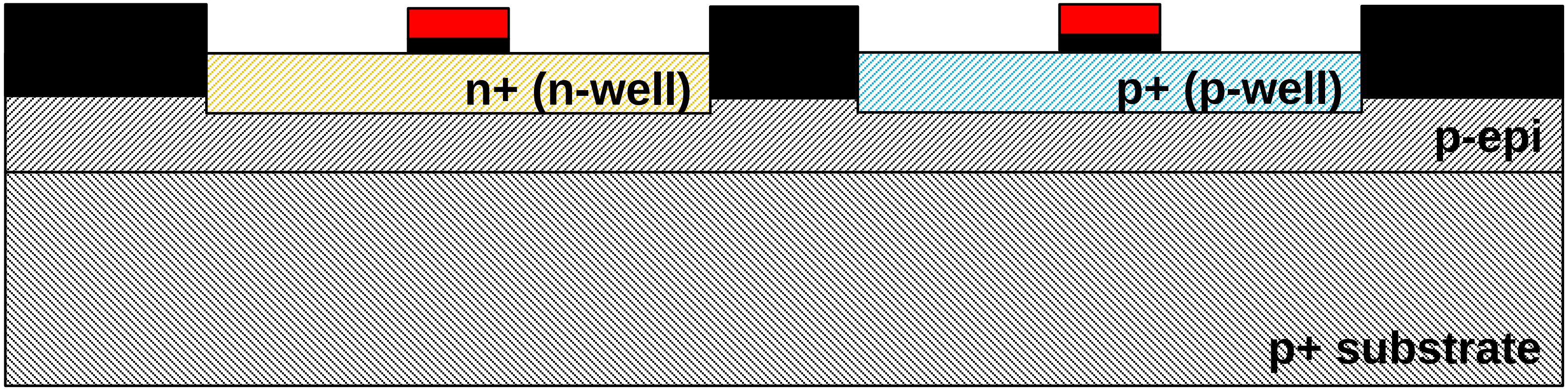
Doping

Semiconductor Manufacturing



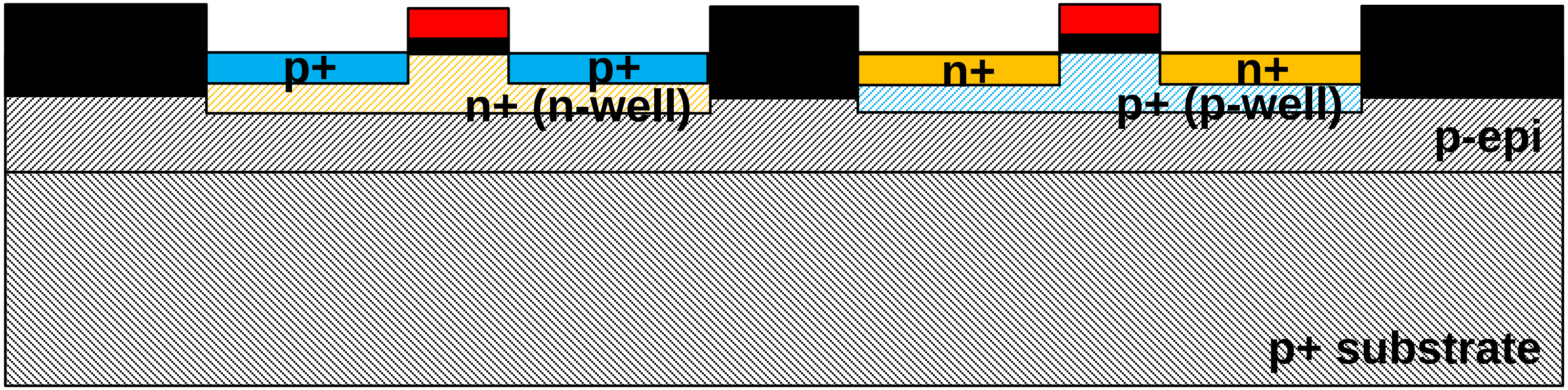
Poly

Semiconductor Manufacturing



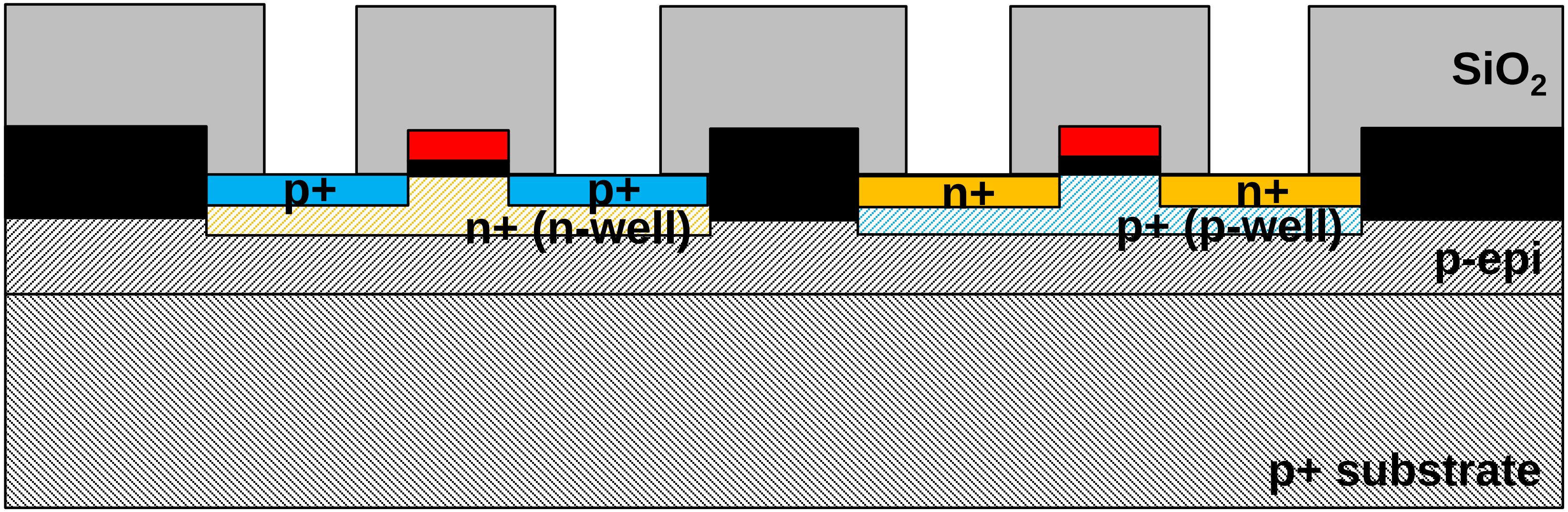
Etch

Semiconductor Manufacturing



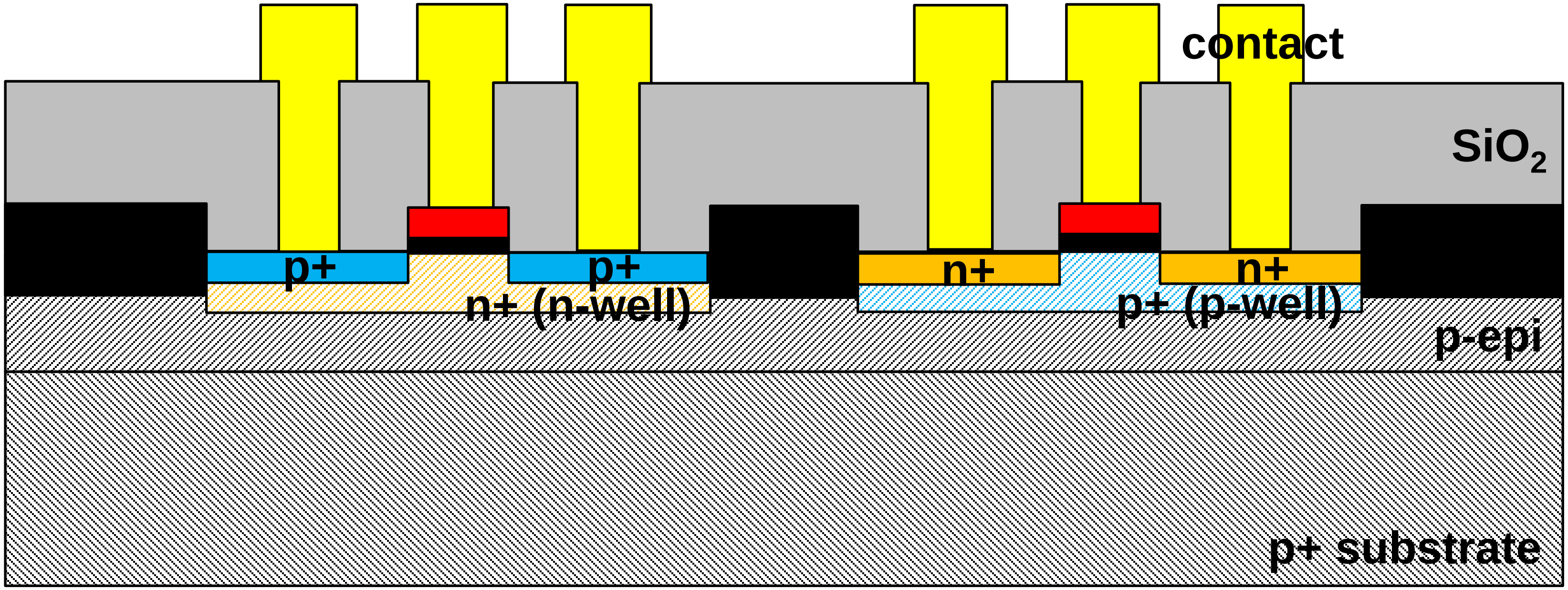
Doping

Semiconductor Manufacturing



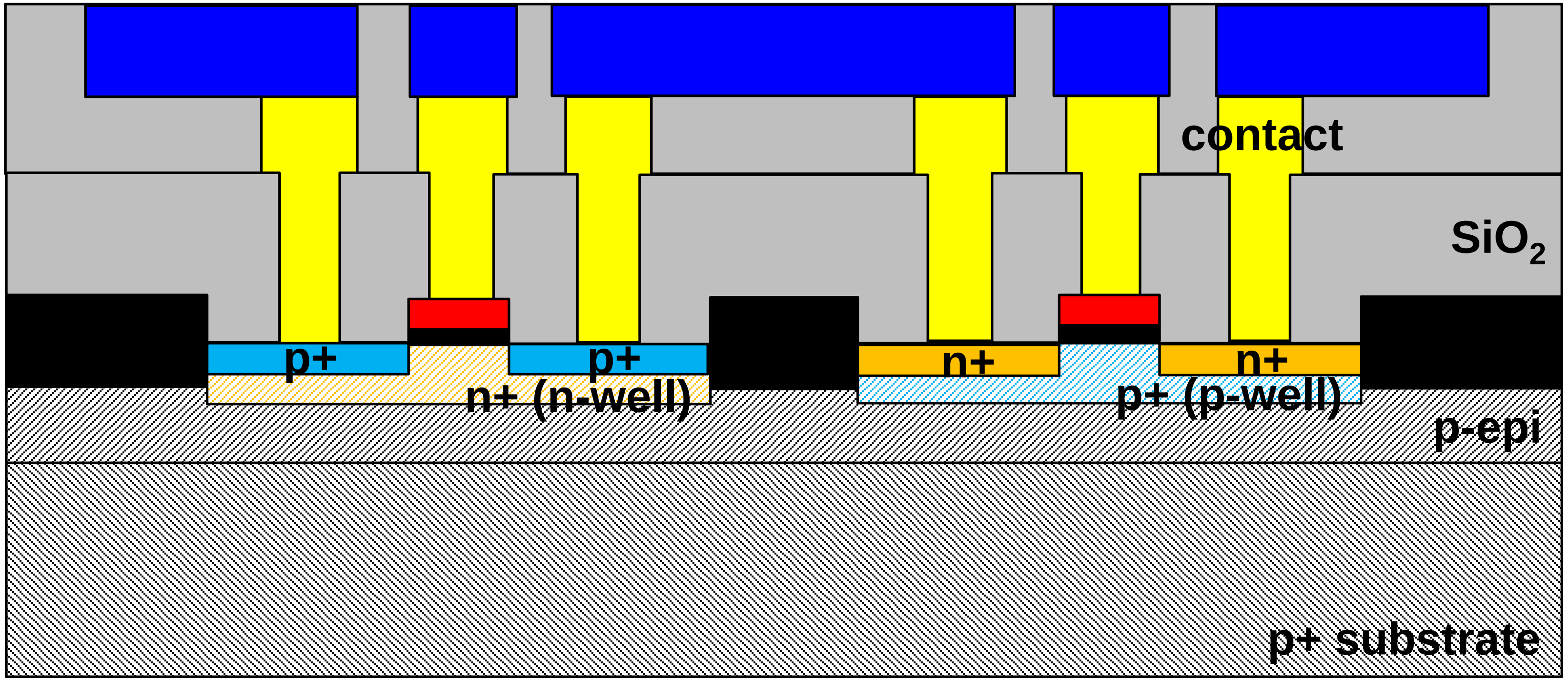
Oxide deposition

Semiconductor Manufacturing



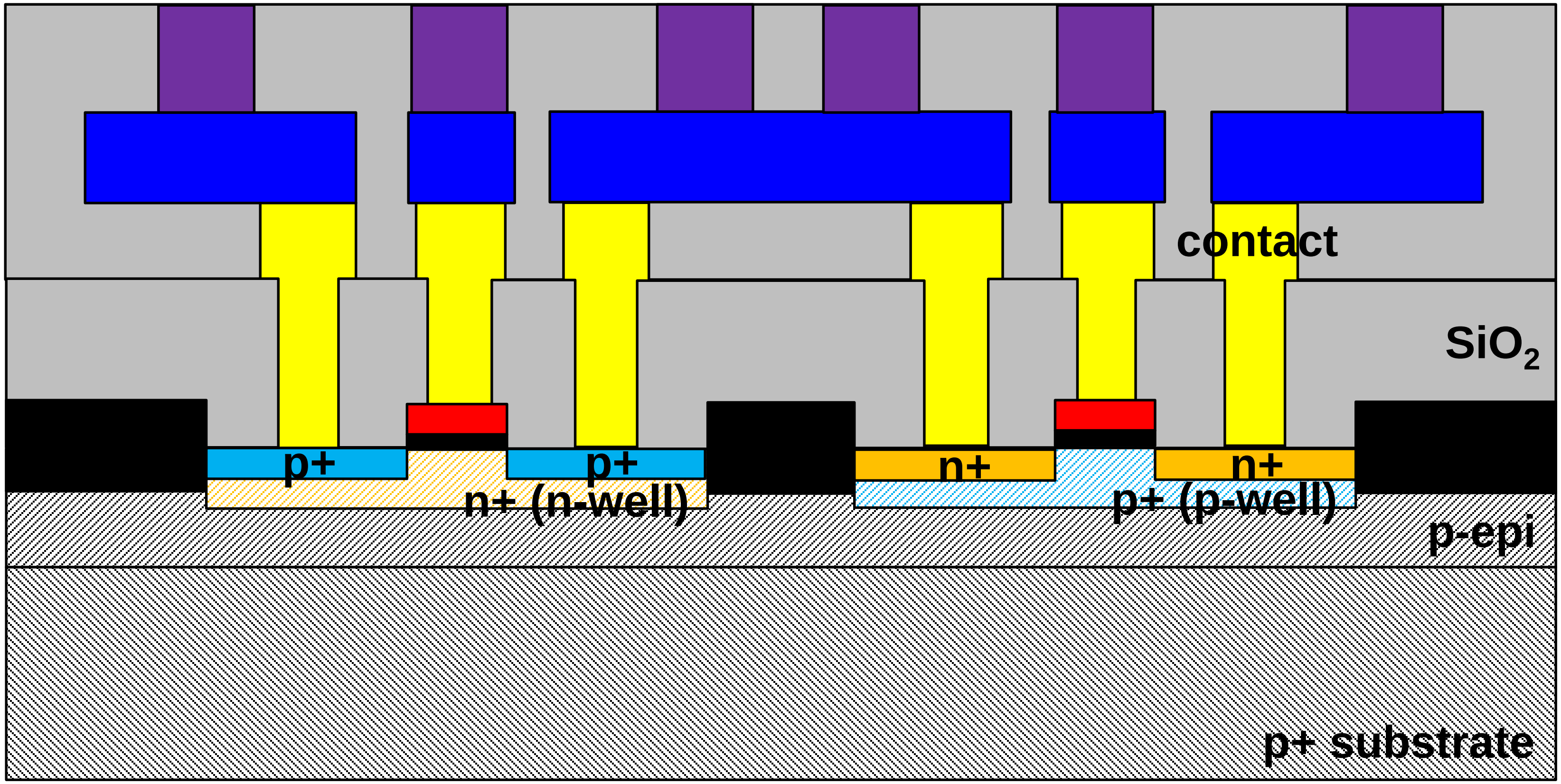
Contact

Semiconductor Manufacturing



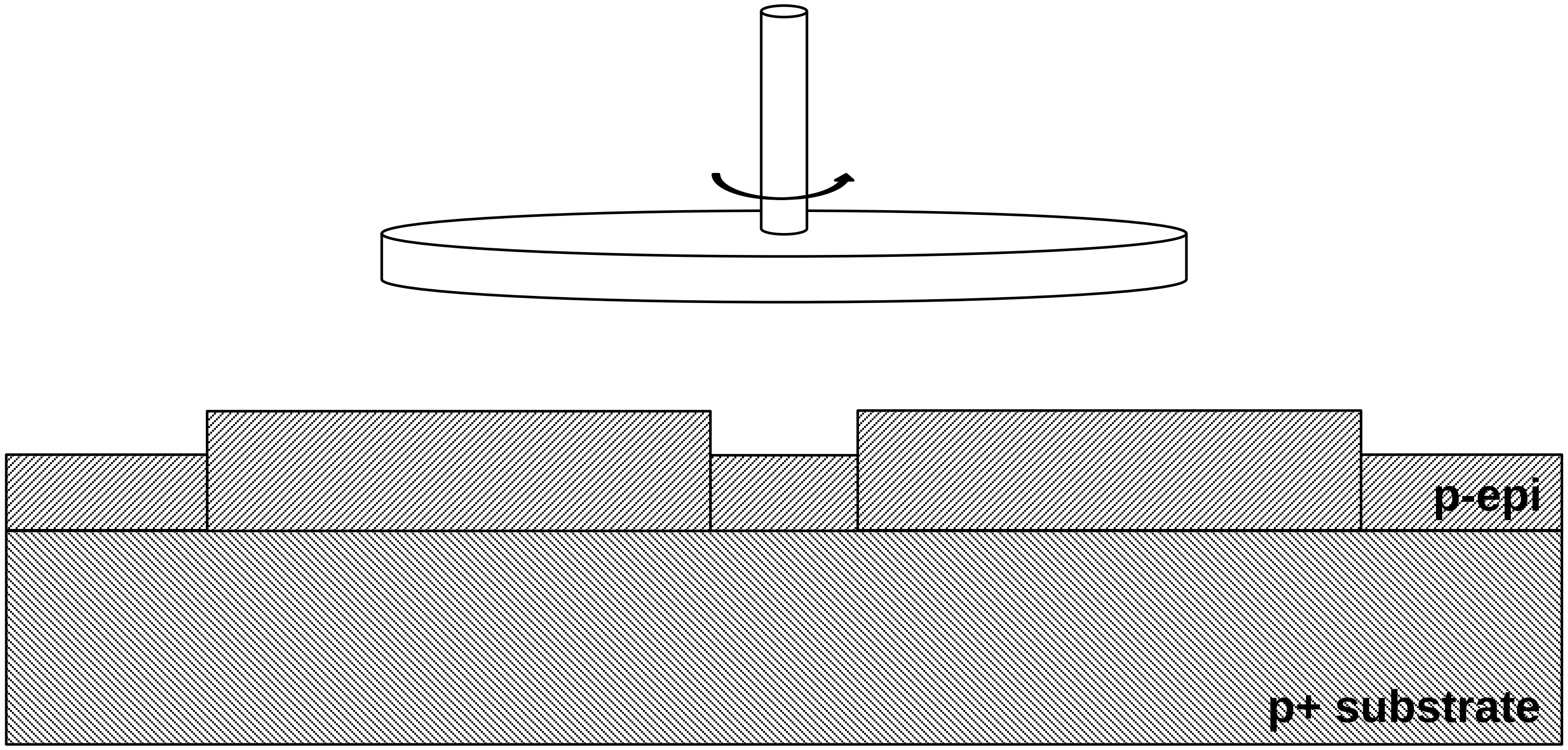
Metal 1

Semiconductor Manufacturing



Via12

Semiconductor Manufacturing



Chemical-mechanical-polishing (CMP)

Semiconductor Manufacturing