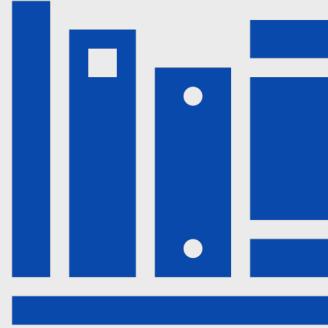


1. CPU的设计与结构

开关演变成运算工具

船说：计算机基础



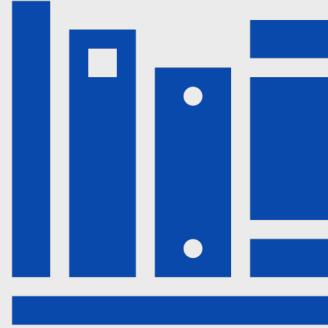
1. CPU的设计与结构

1.2. 开关演变成运算工具

01 开关对计算的影响

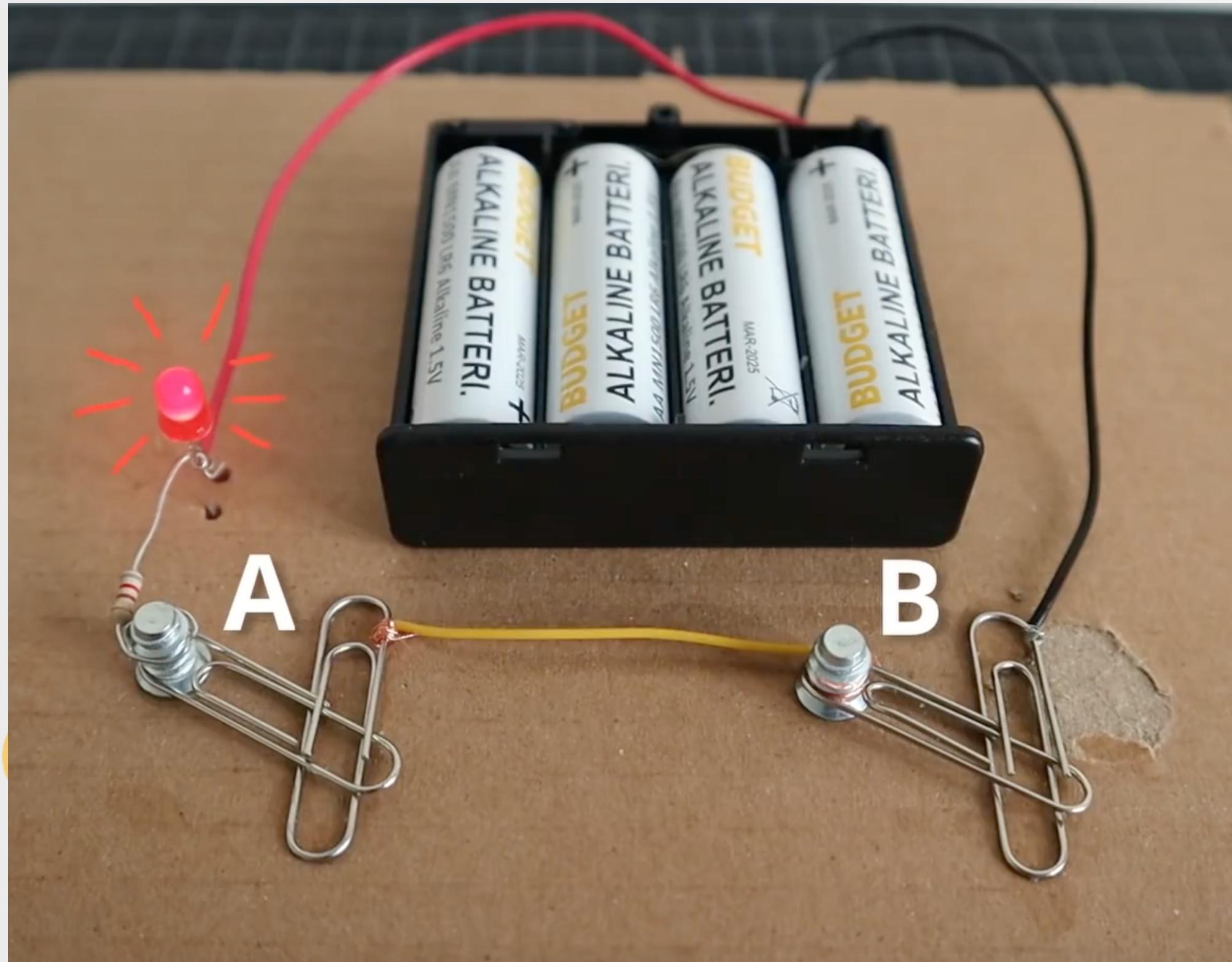
02 认识半导体

03 MOSFET的结构与工作原理

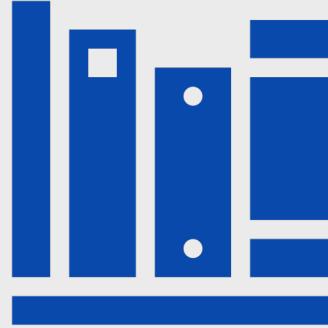


1. CPU的设计与结构

1.2.1 开关对计算的影响

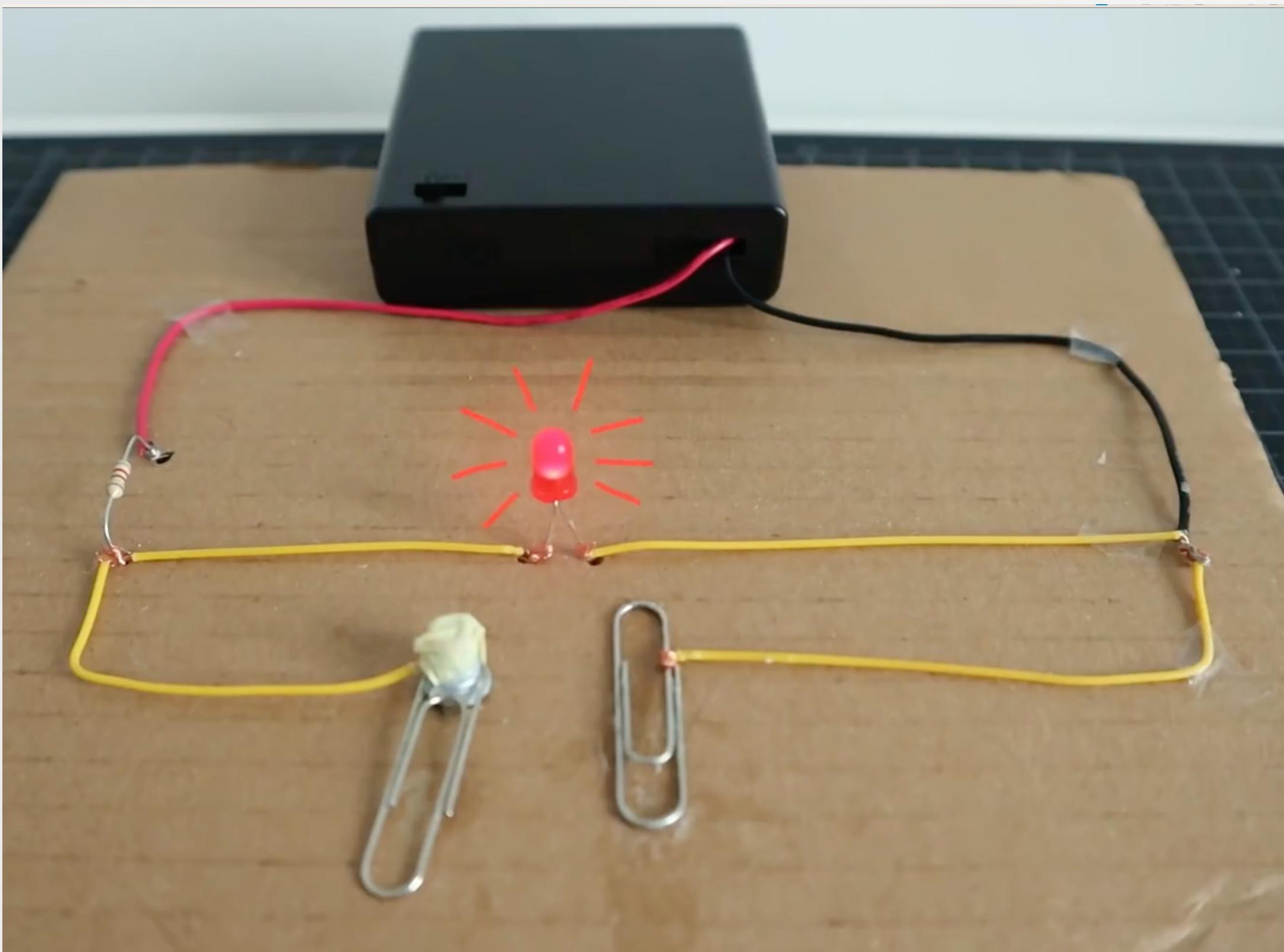


A	B	Output
0	0	0
1	0	0
0	1	0
1	1	1

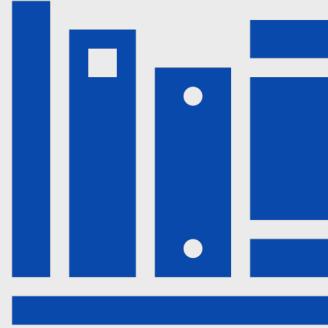


1. CPU的设计与结构

1.2.1 开关对计算的影响

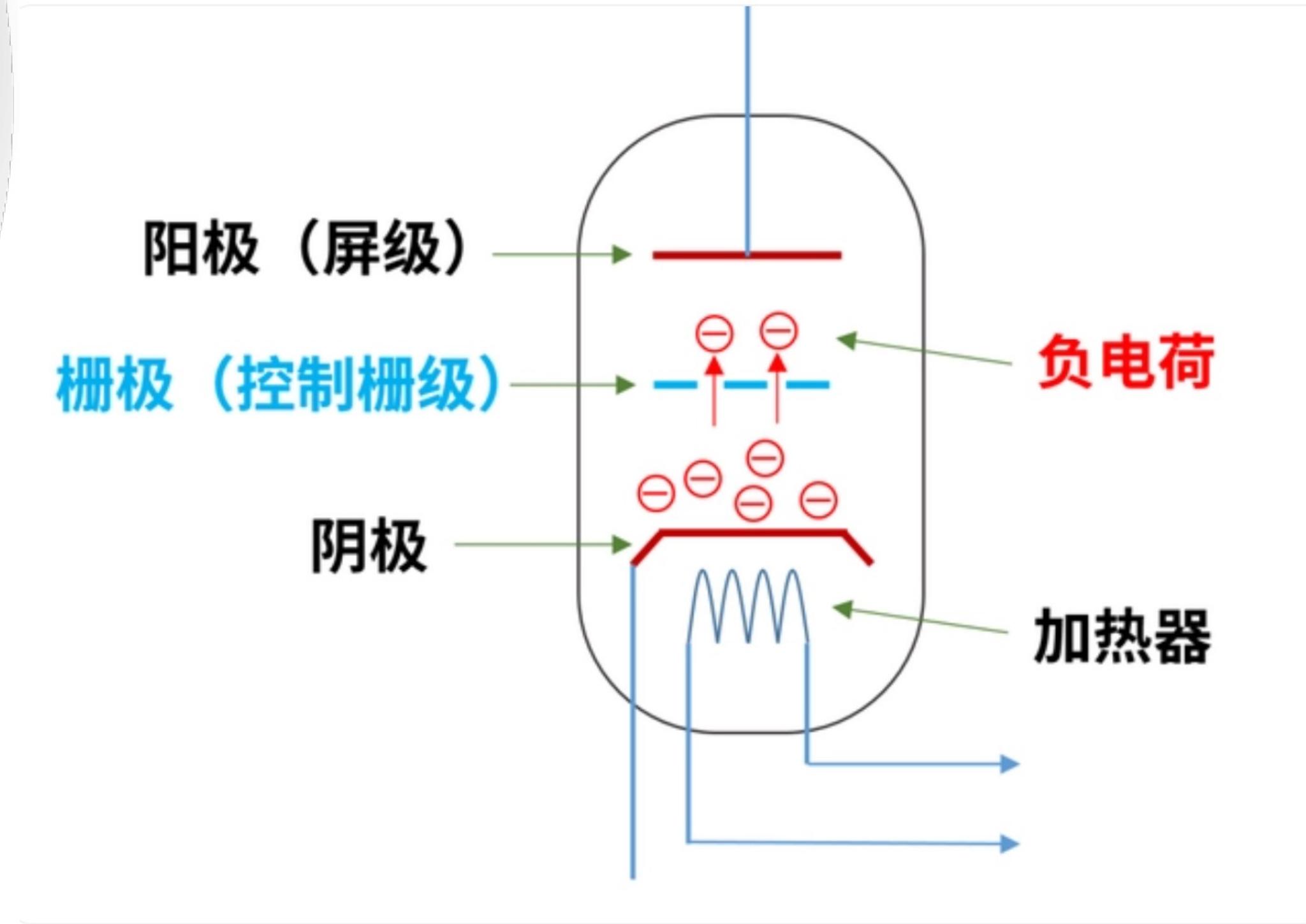
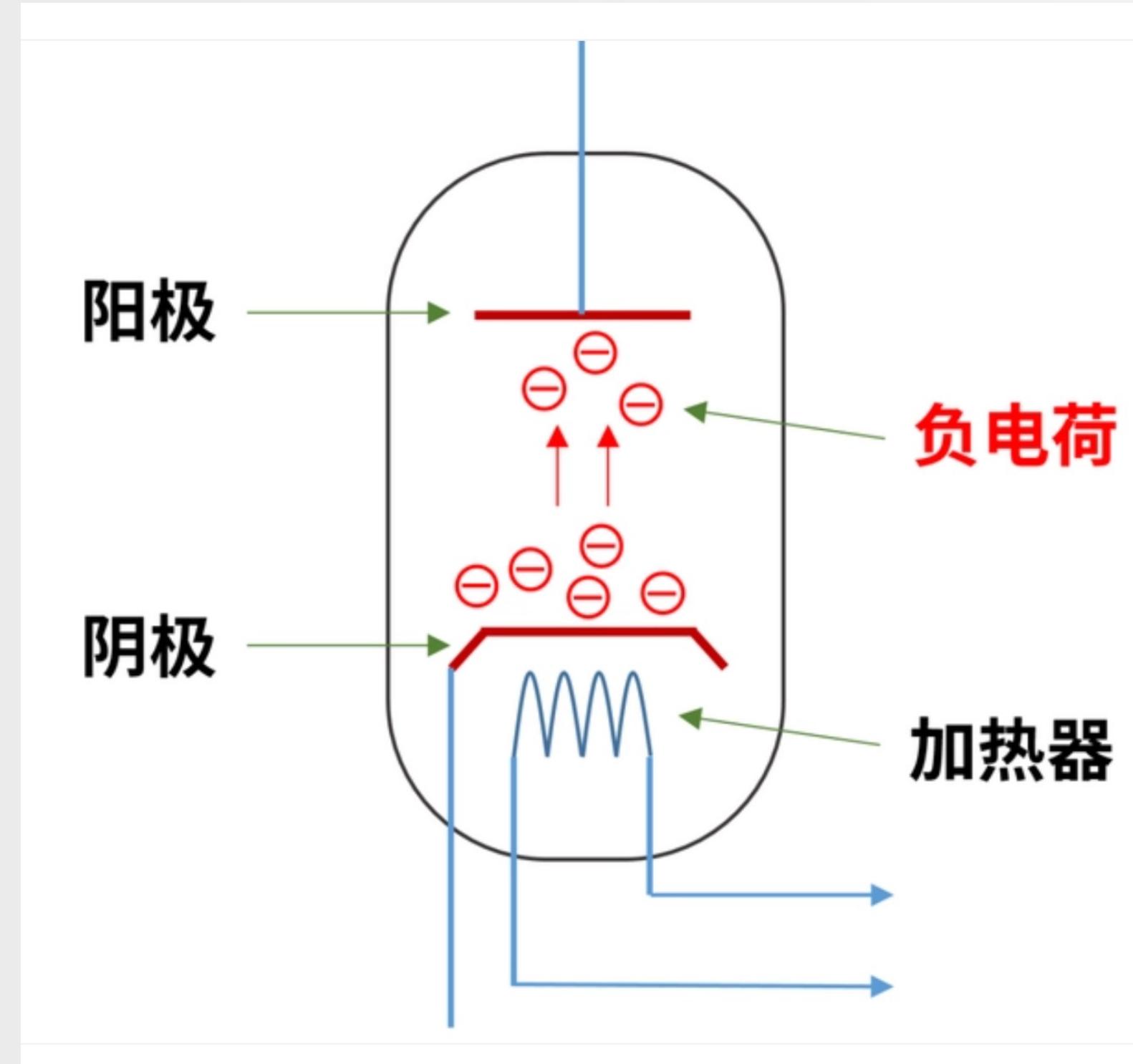


A	Output
0	1
1	0



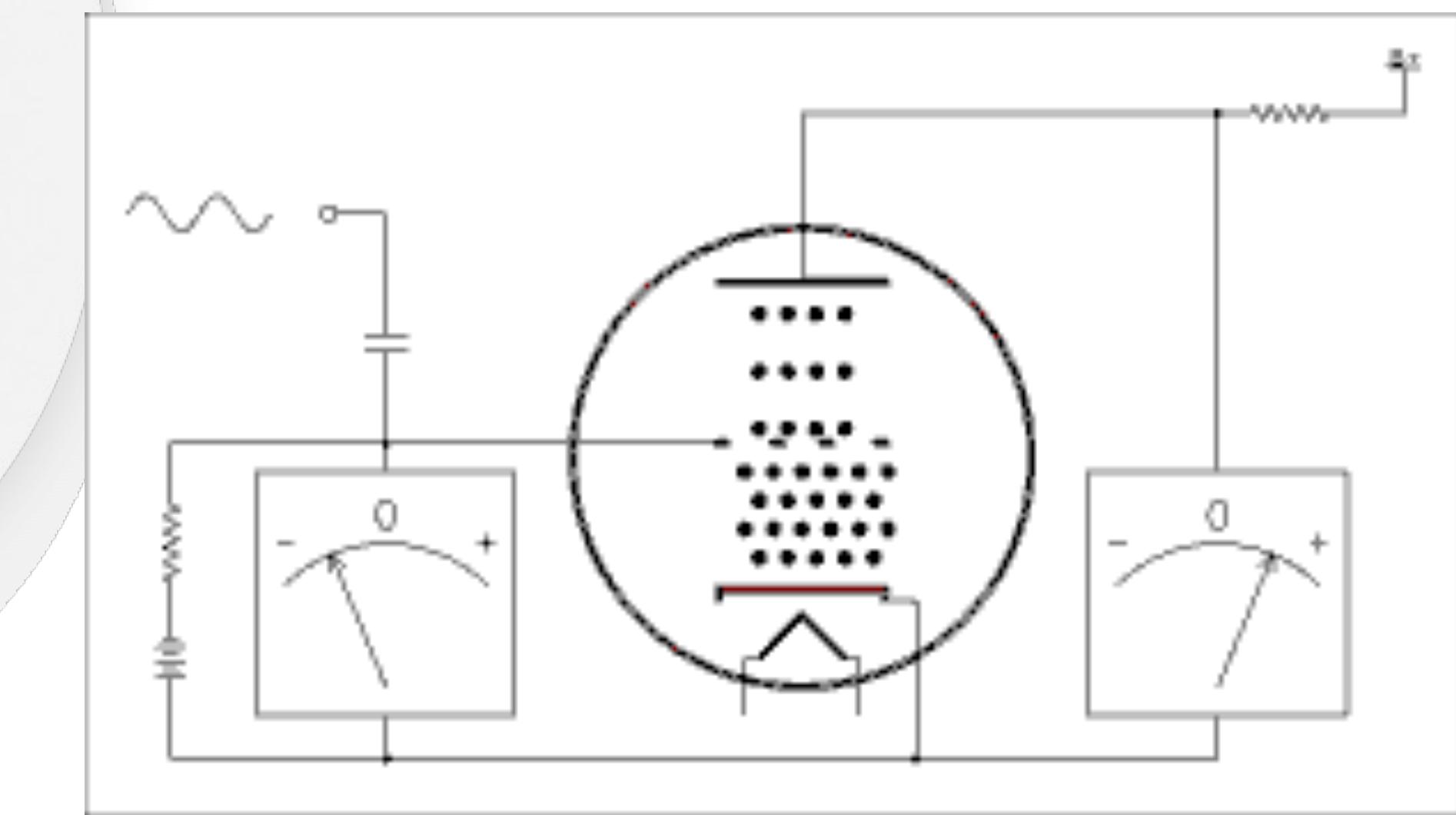
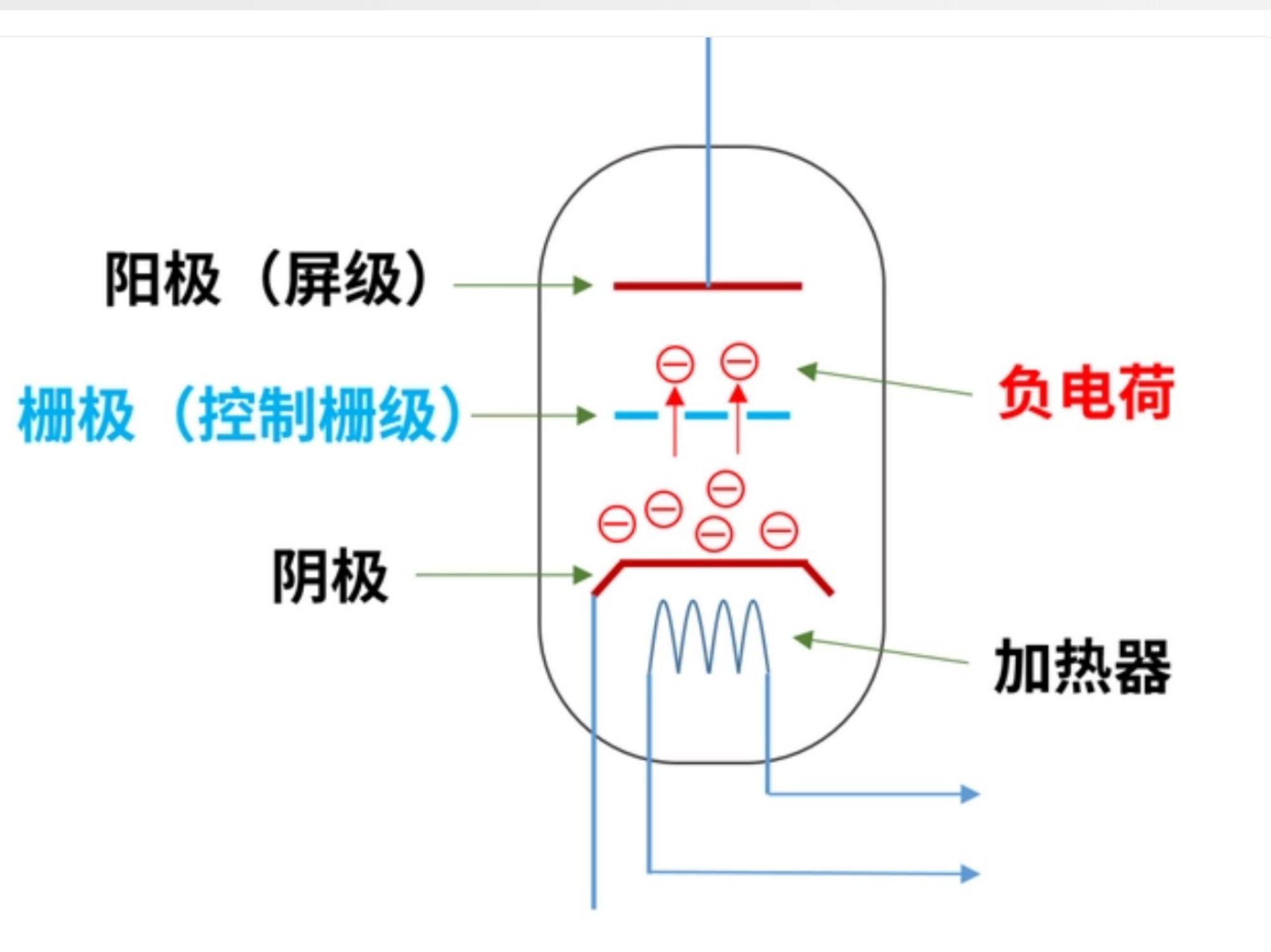
1. CPU的设计与结构

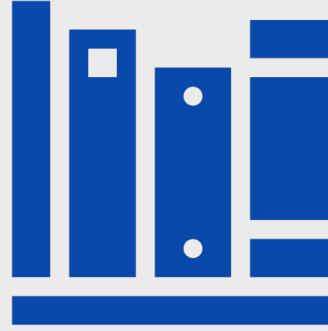
1.2.1 电流控制器件



1. CPU的设计与结构

1.2.1 电流控制器件





1. CPU的设计与结构

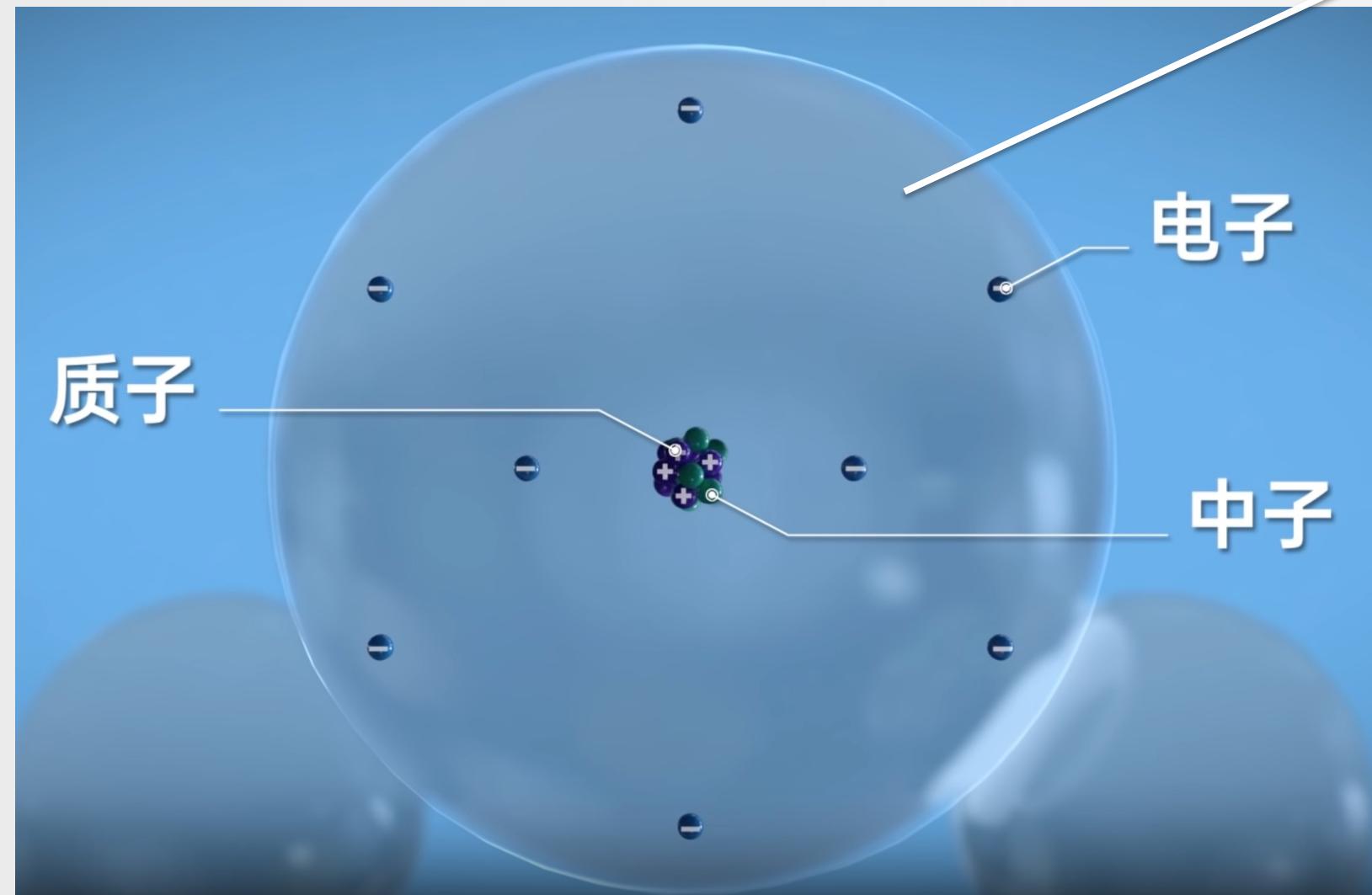
1.2.1 电流控制器件



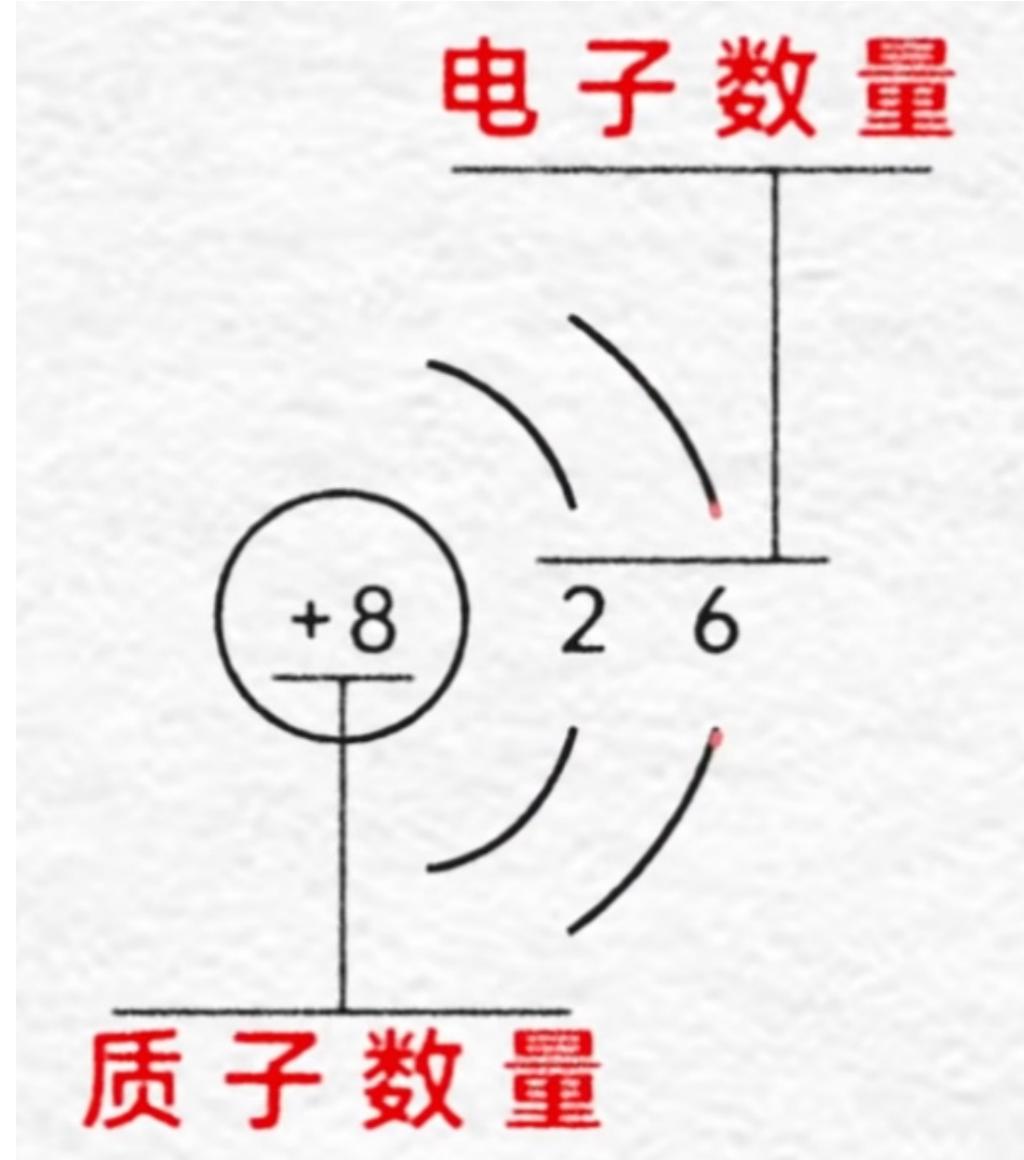
真空三极管

那一时期电子工业的心脏。
越来越强大的广播电台、收音机、
留声机、电影、电台、雷达、无线
电对讲等都基于它。

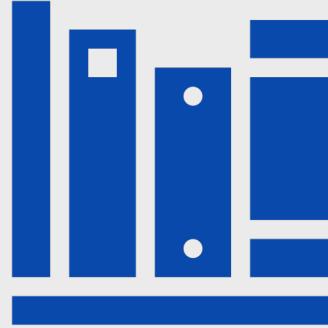
1.2.2 认识半导体



电子云

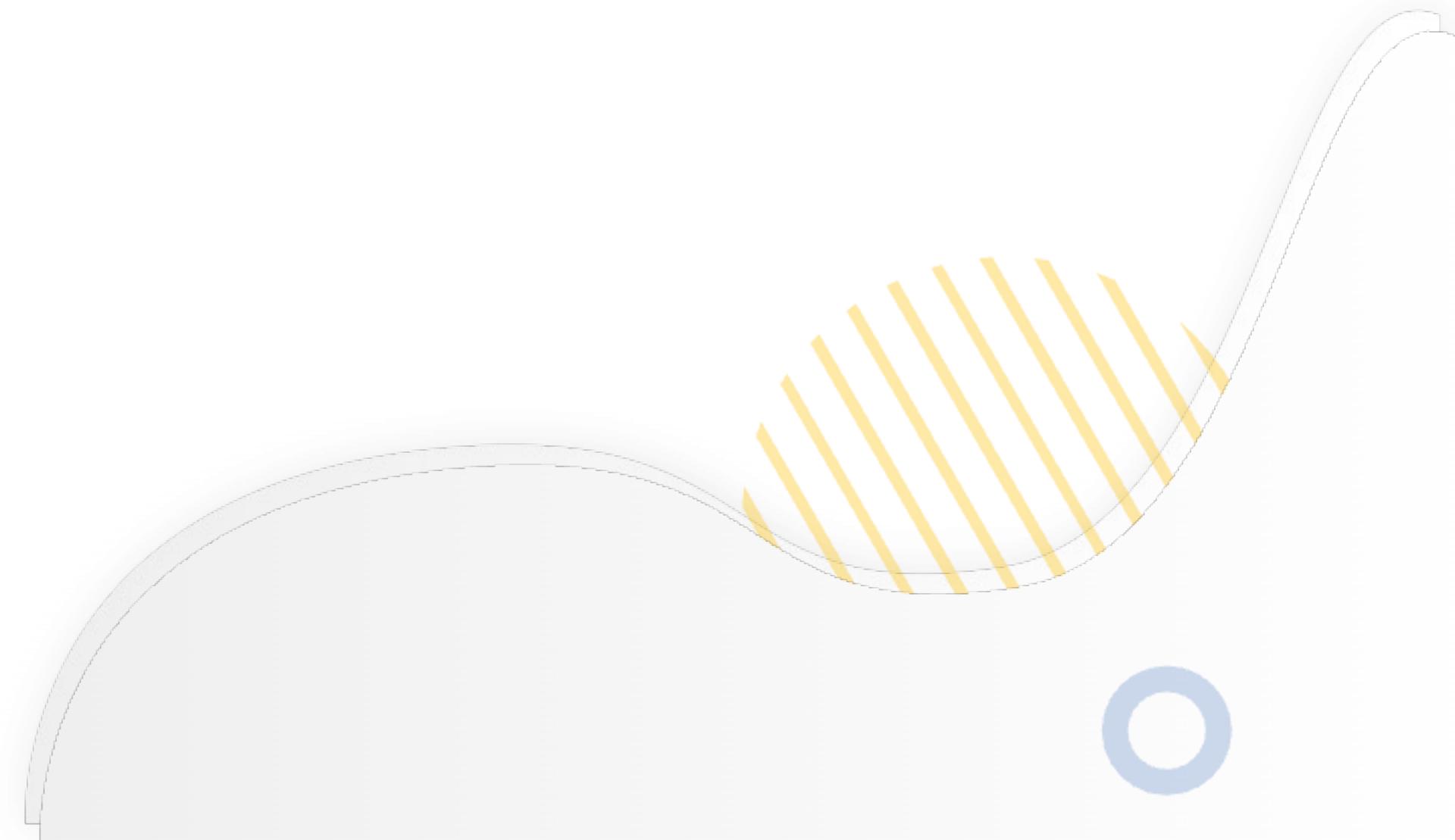
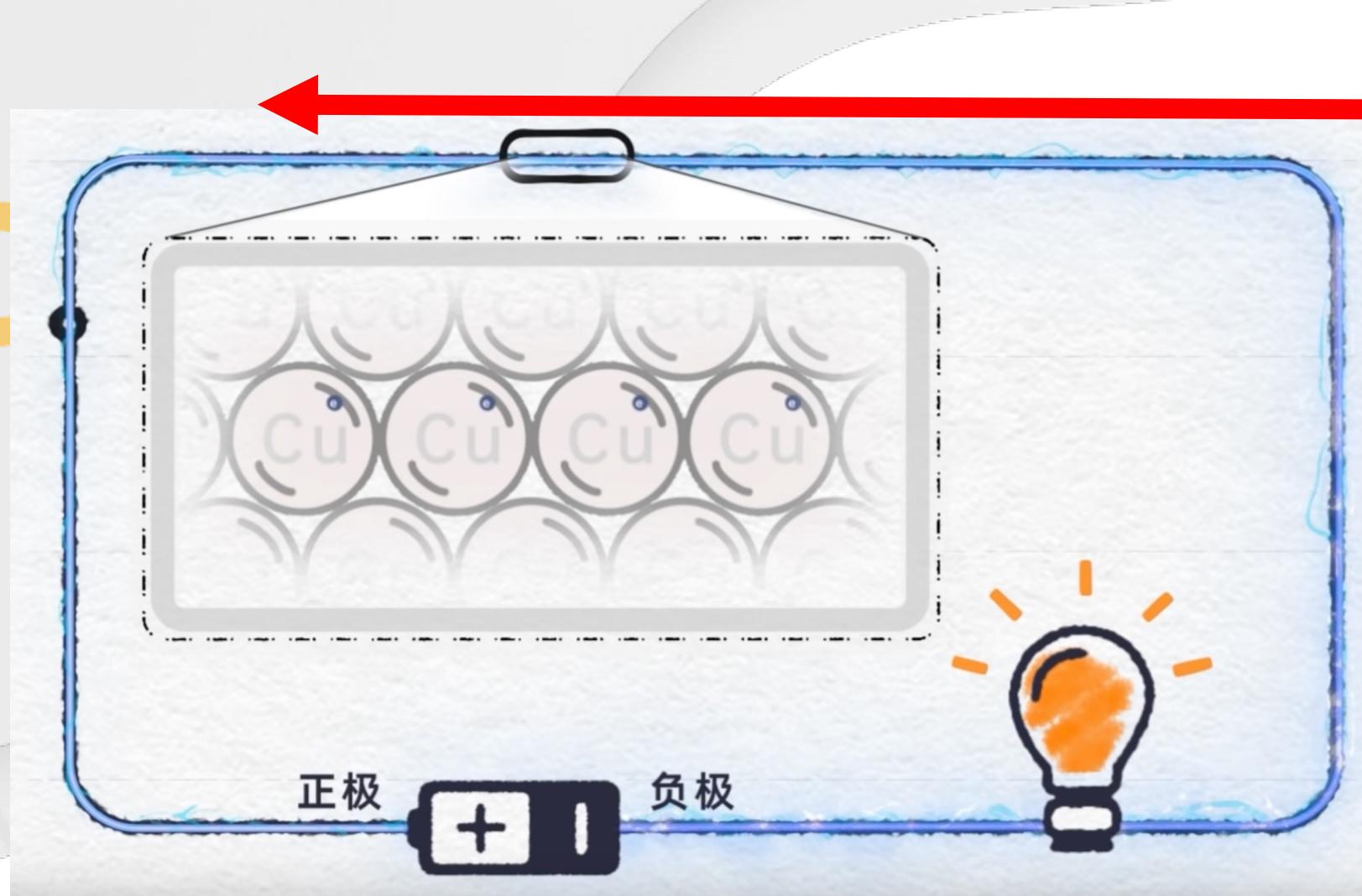
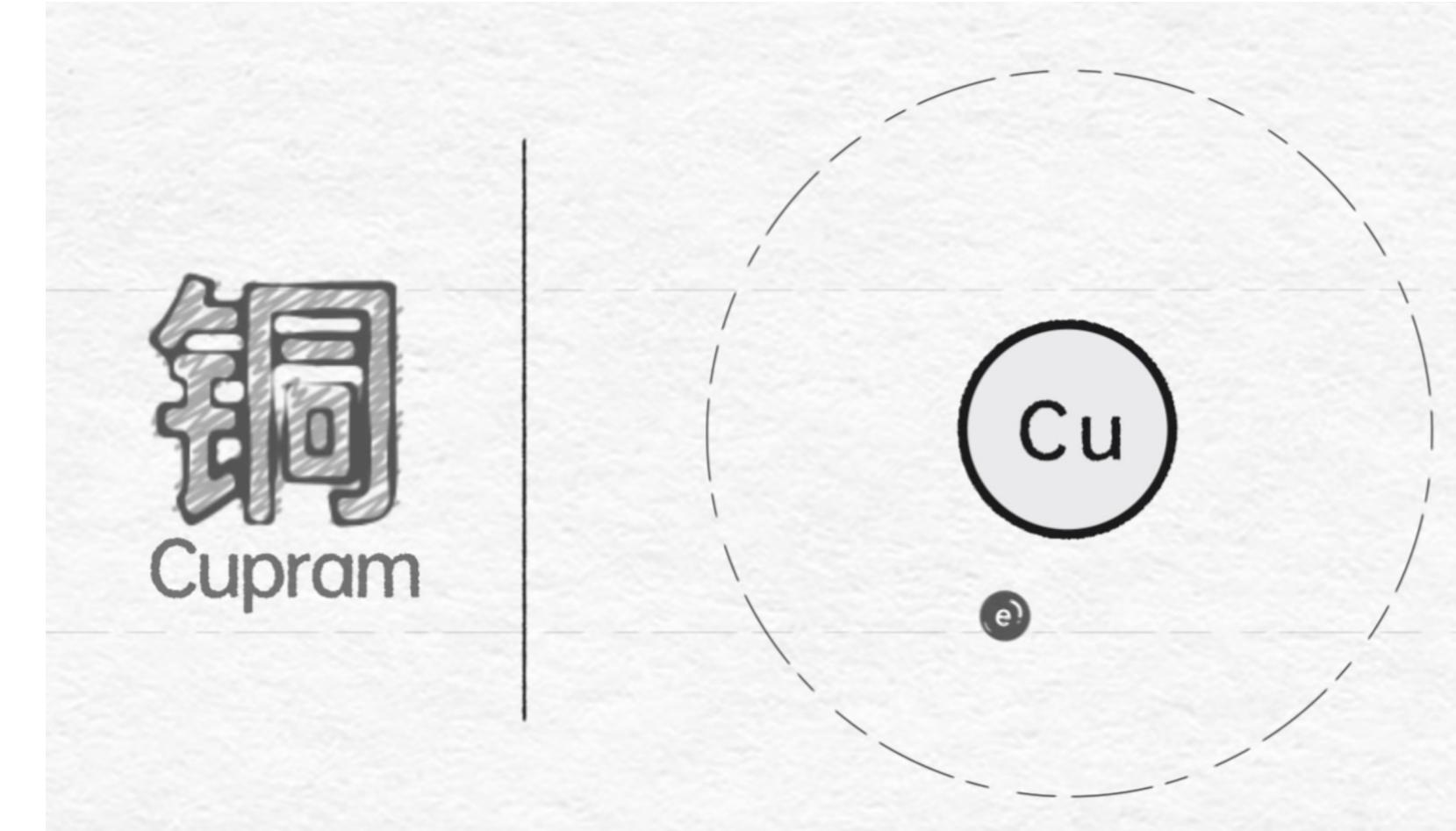
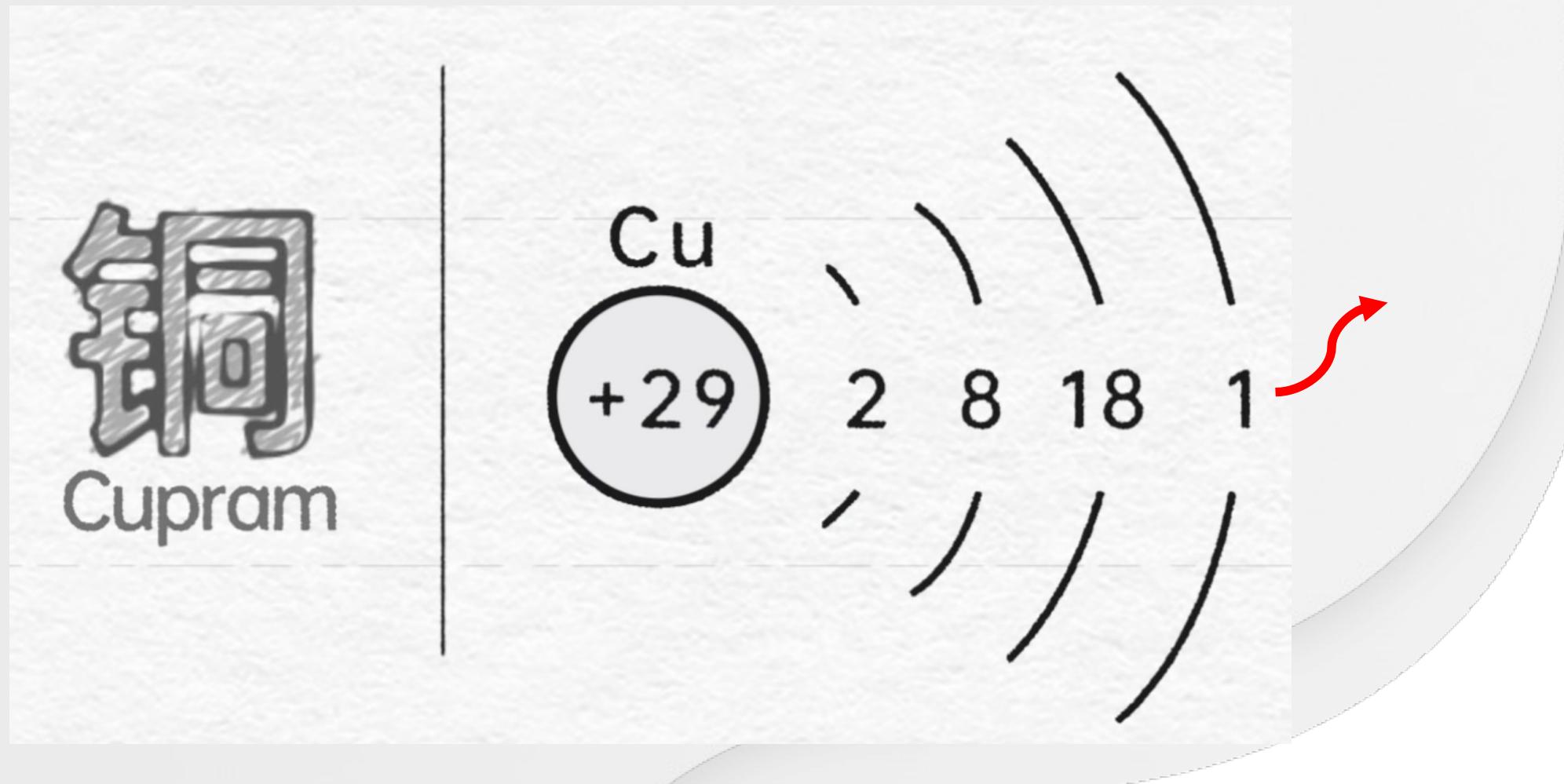


氧原子



1. CPU的设计与结构

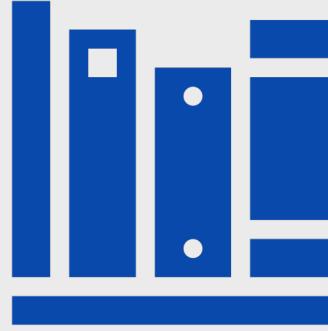
1.2.2 认识半导体



1. CPU的设计与结构

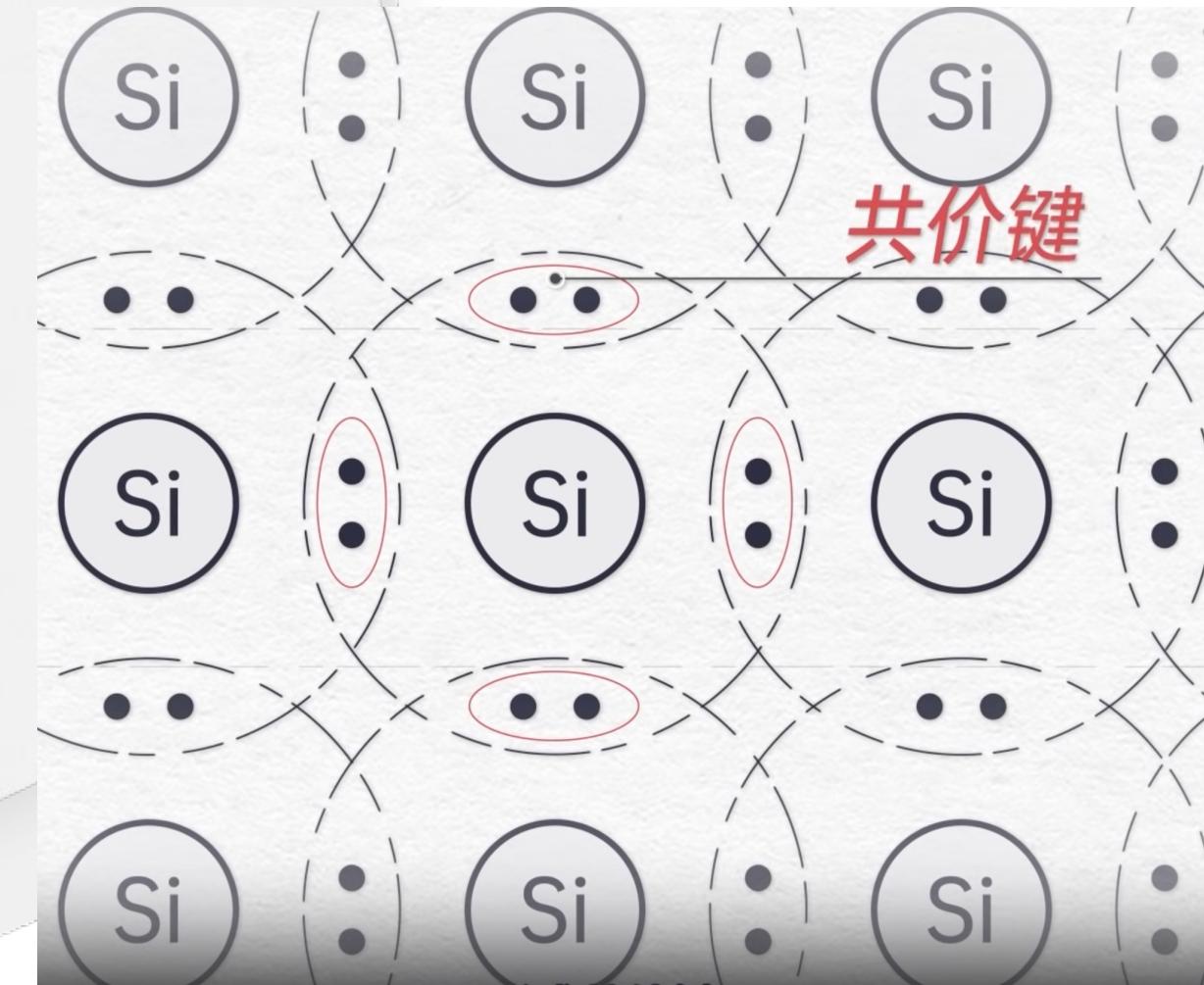
1.2.2 认识半导体



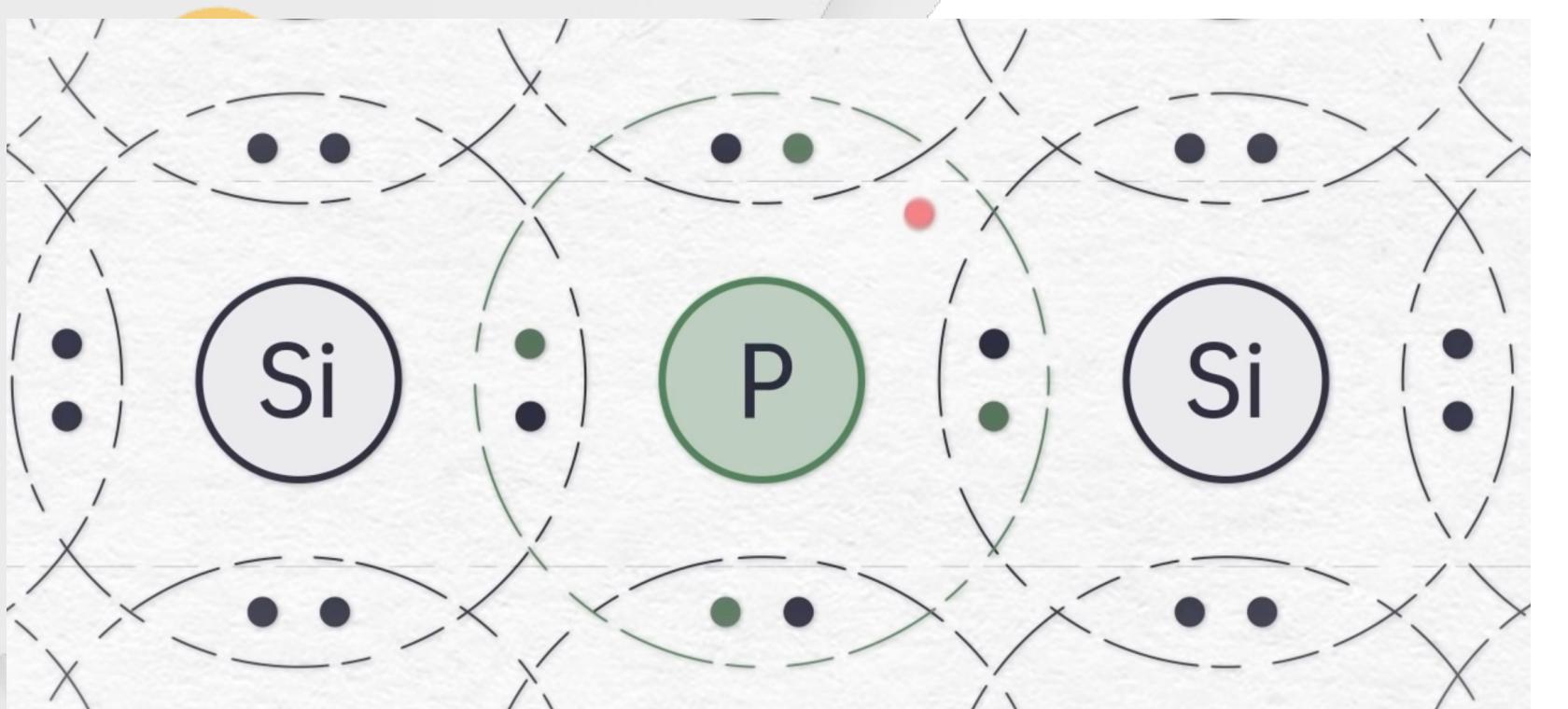


1. CPU的设计与结构

1.2.2 认识半导体



电子稳定，导电性很弱

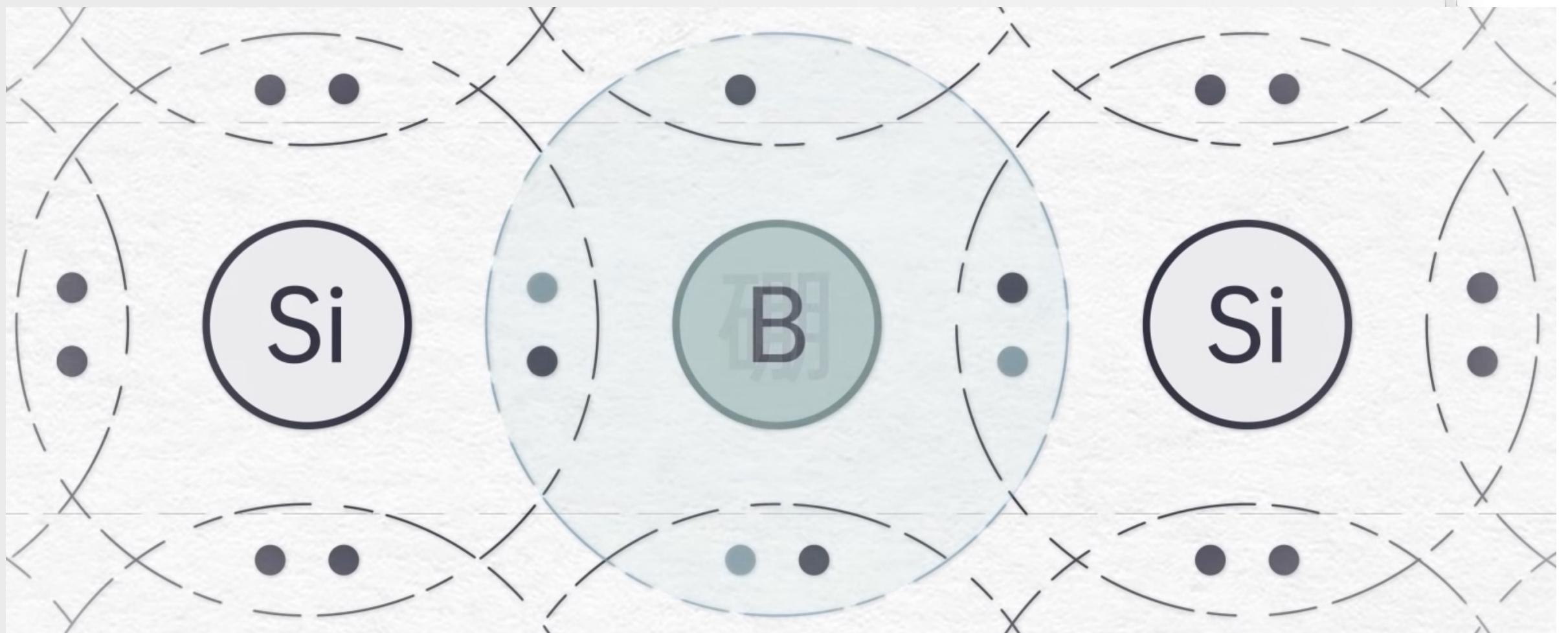


N型掺杂，
载流子是多出的电子

硅中掺杂磷P后，多出一个电子

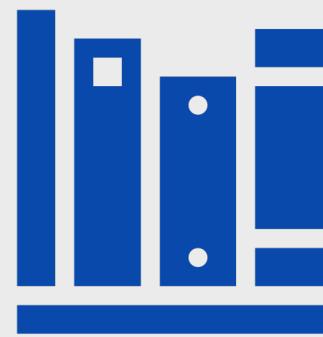
1. CPU的设计与结构

1.2.2 认识半导体



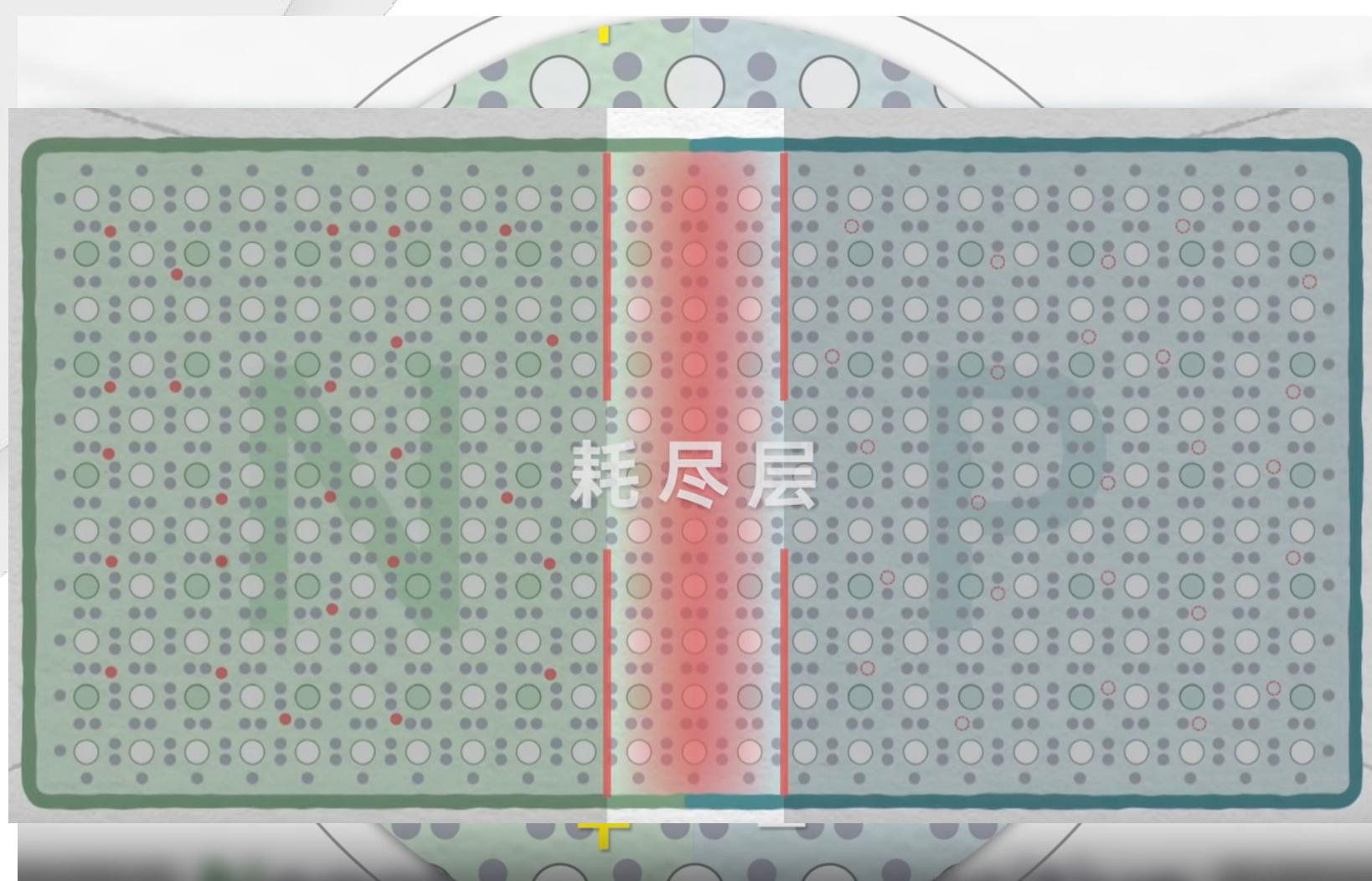
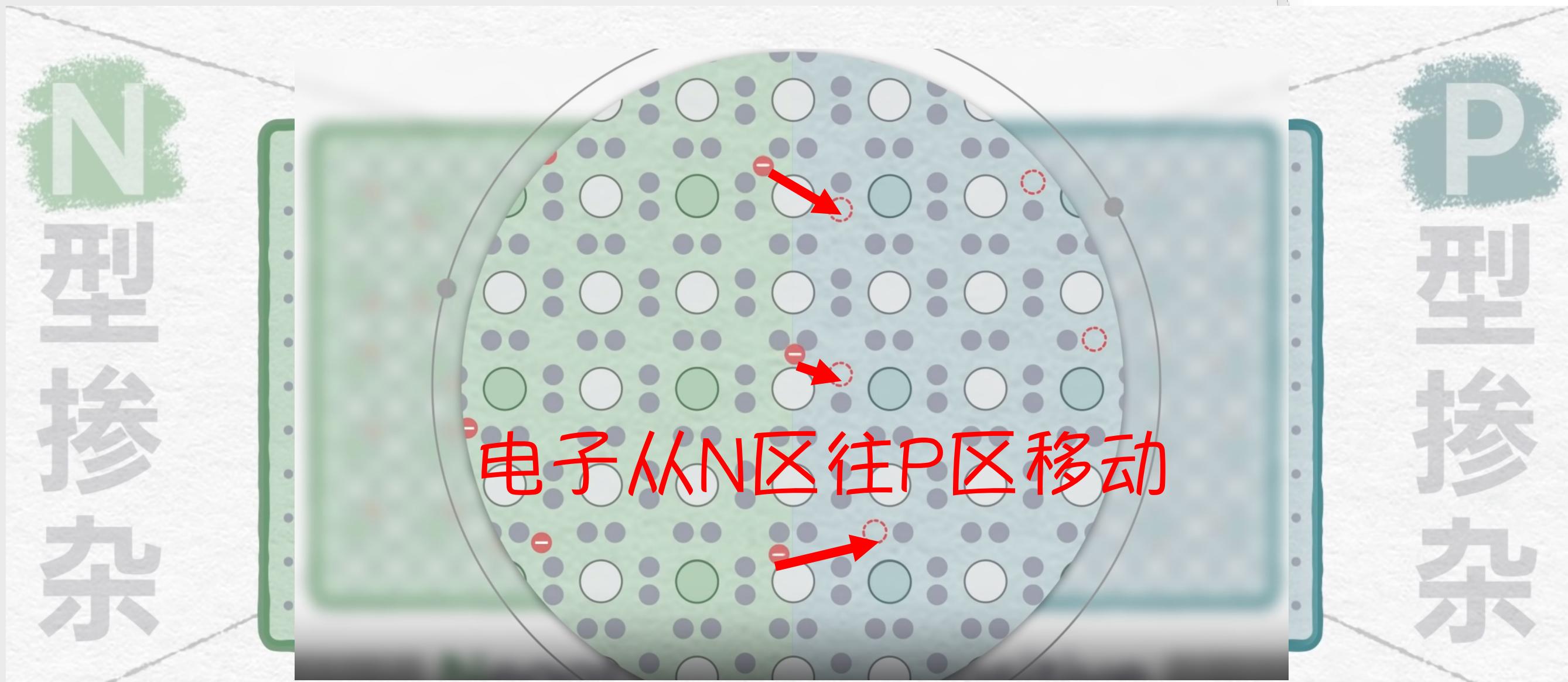
P型掺杂，
载流子是多出的空穴

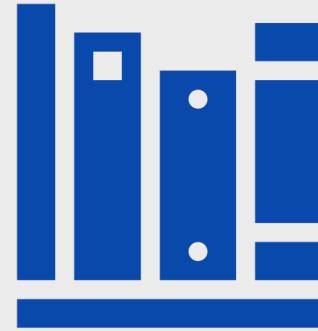
硅中掺杂硼B后，少一个电子



1. CPU的设计与结构

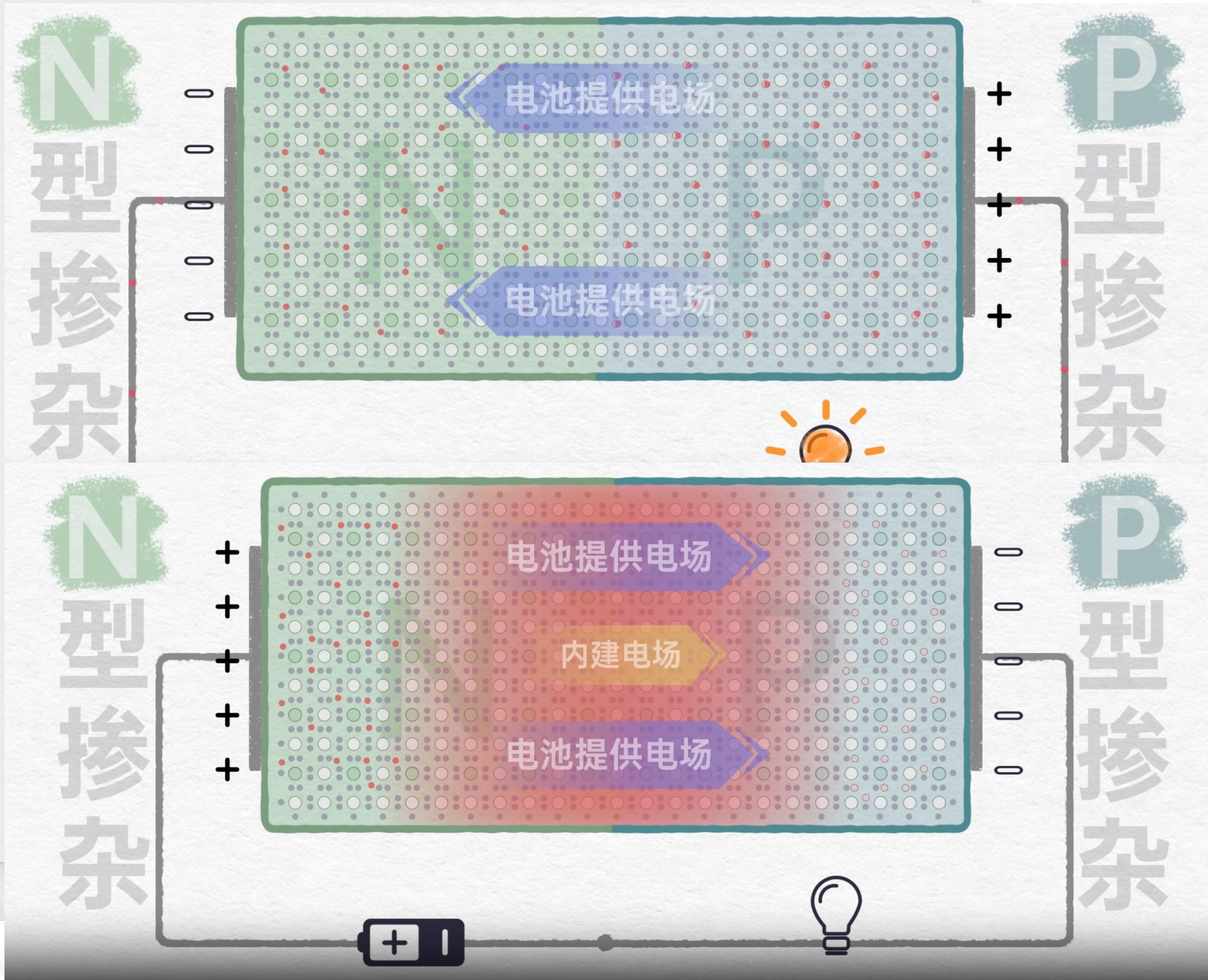
1.2.2 认识半导体





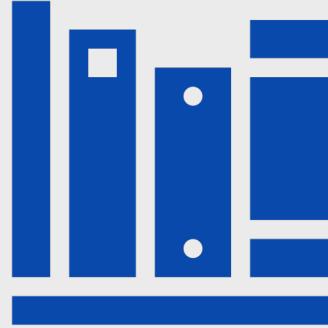
1. CPU的设计与结构

1.2.2 认识半导体



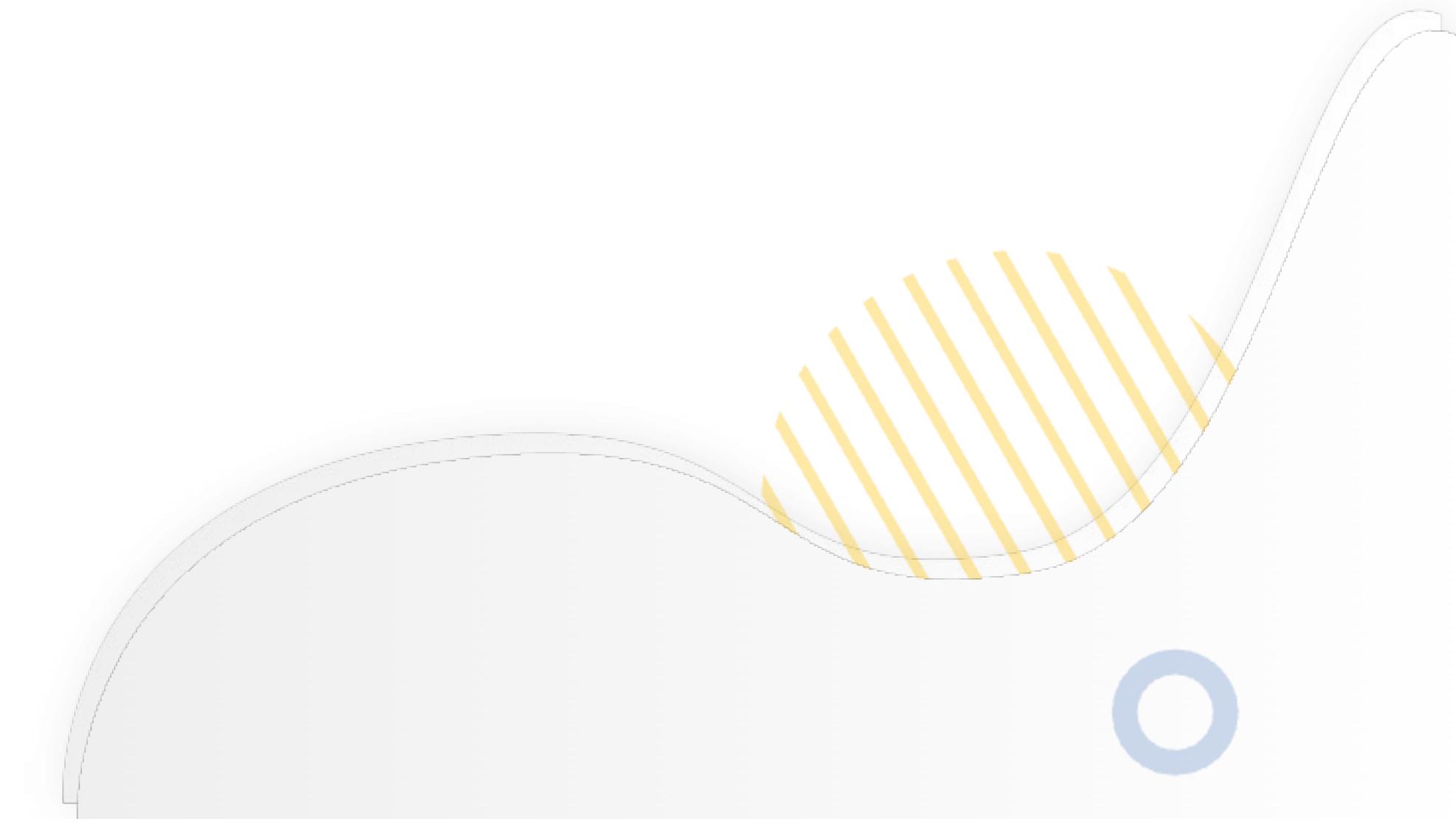
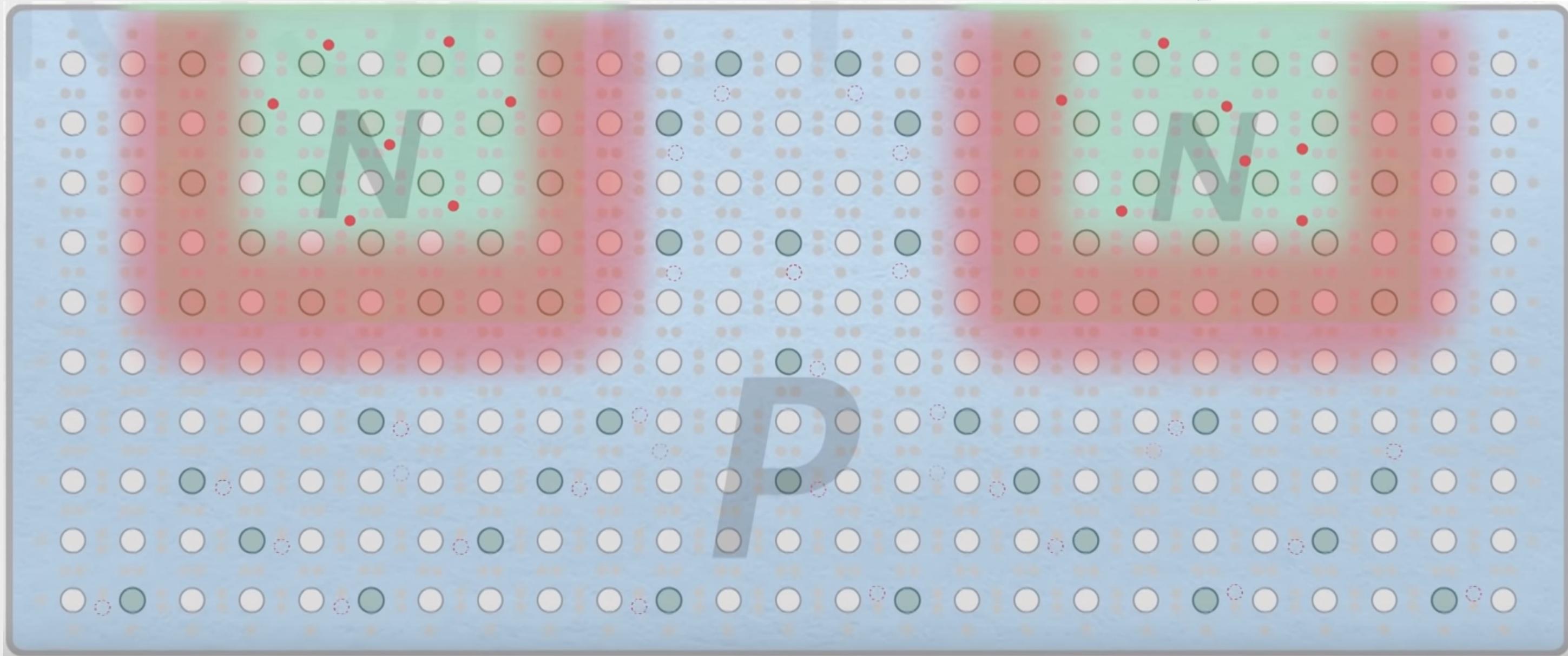
结论：
 $P \rightarrow N$ 导通、
 $N \rightarrow P$ 不导通

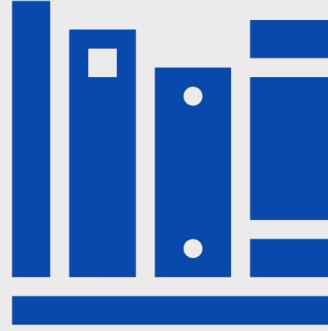




1. CPU的设计与结构

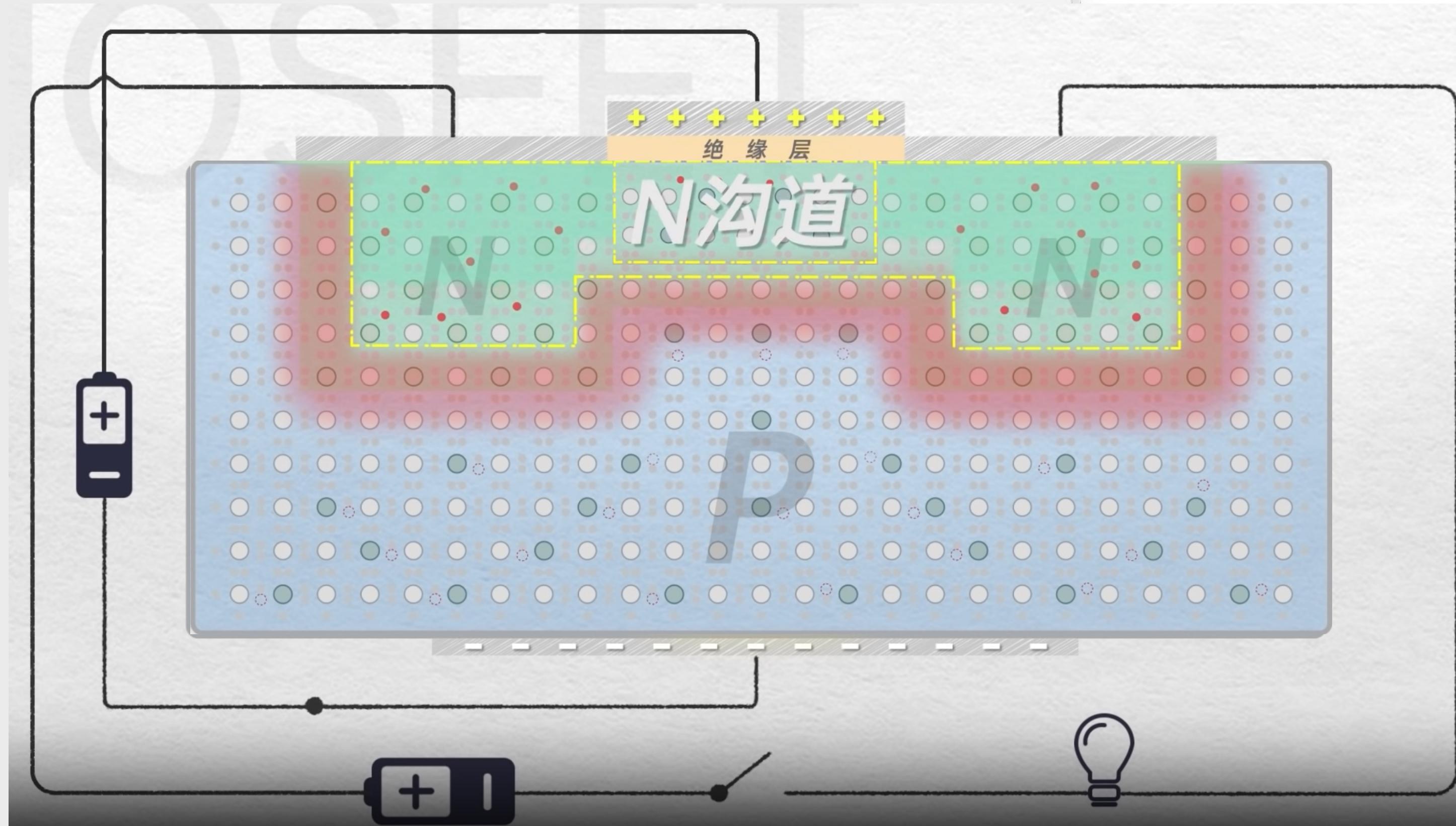
1.2.3 MOSFET的结构与工作原理

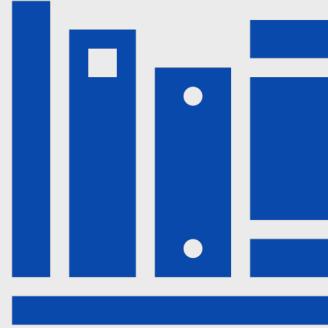




1. CPU的设计与结构

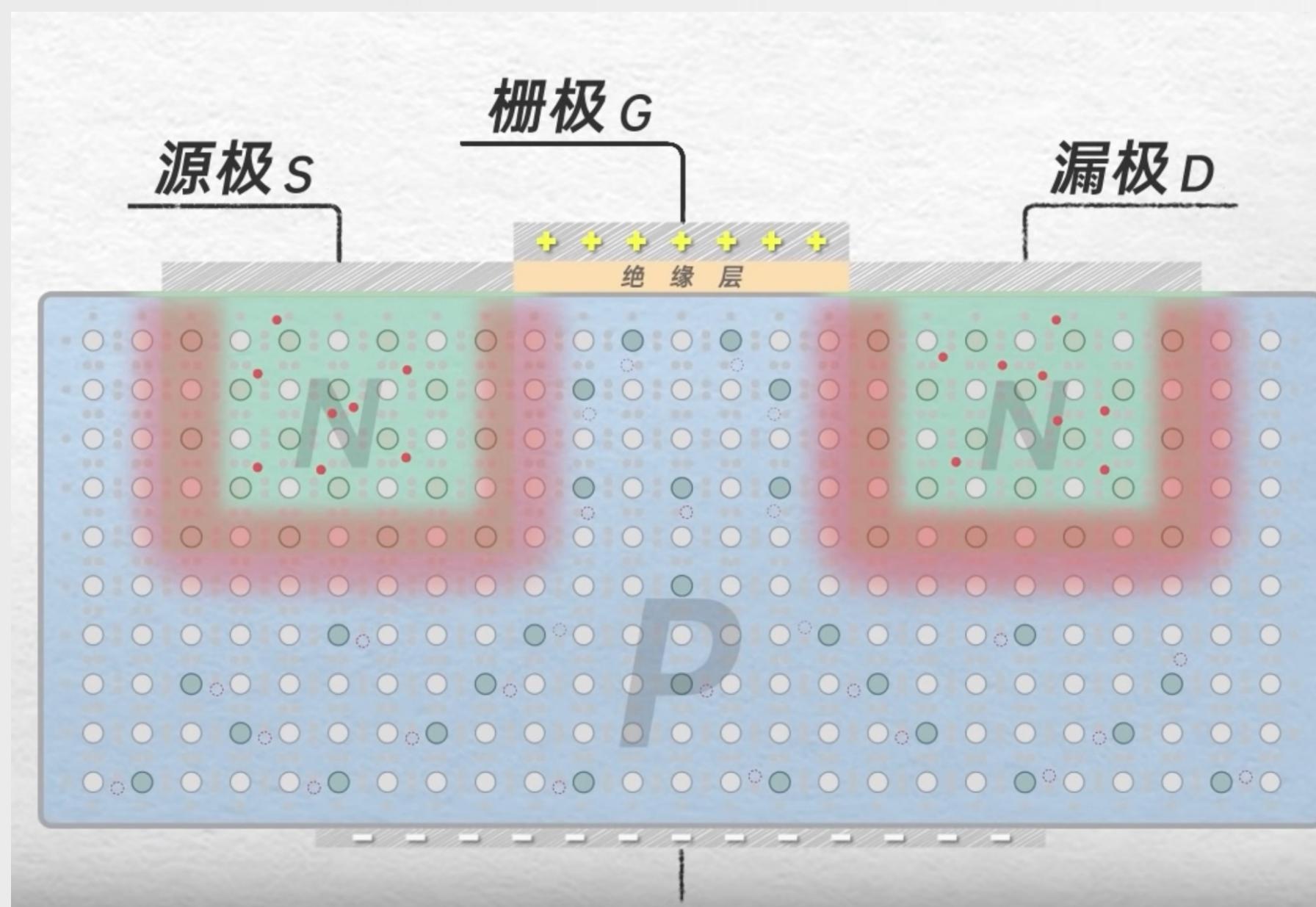
1.2.3 MOSFET的结构与工作原理





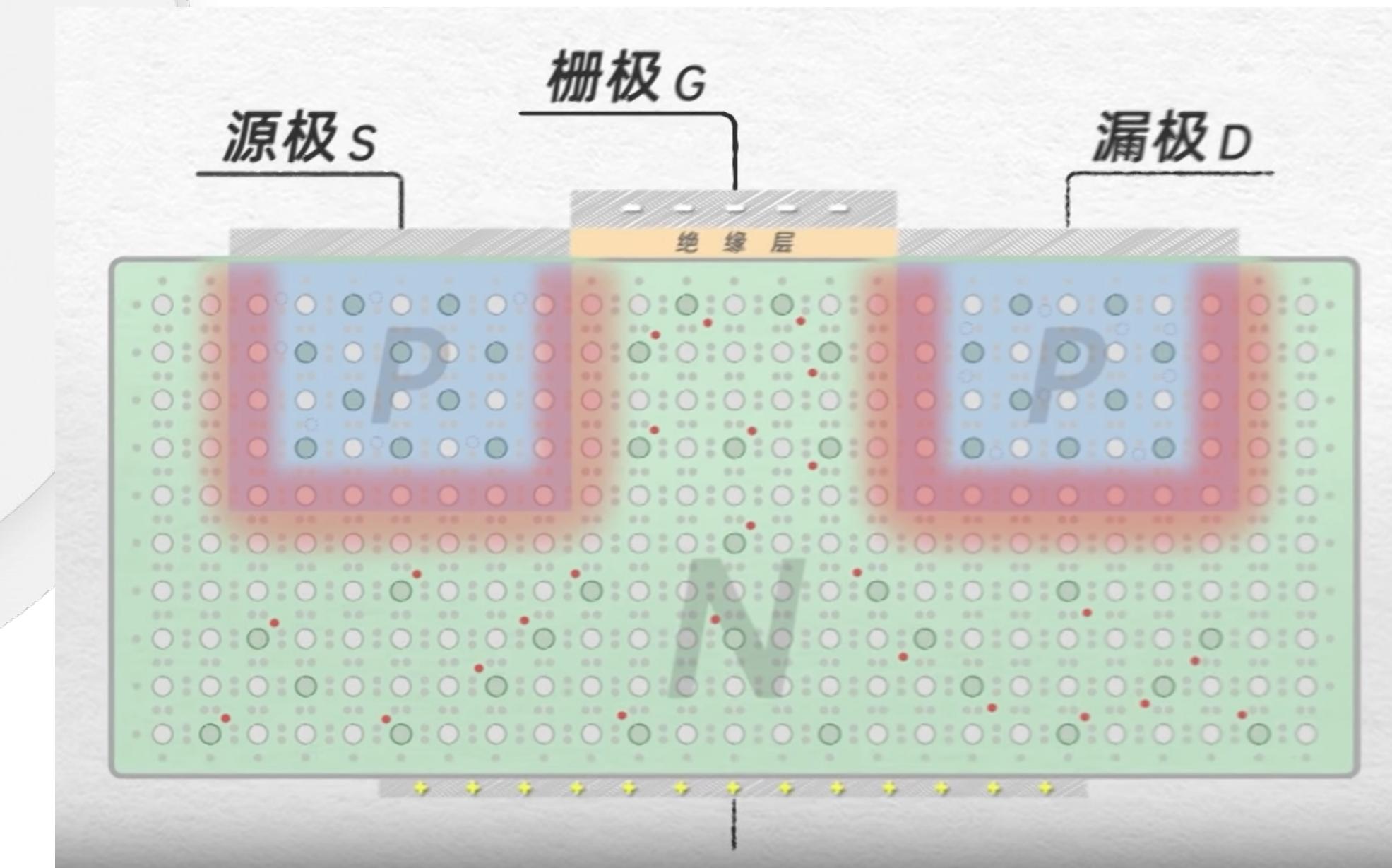
1. CPU的设计与结构

1.2.3 MOSFET的结构与工作原理



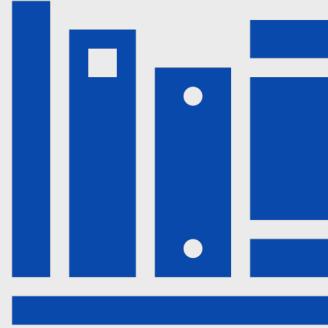
当电压高于阈值电压 可以导通
当电压低于阈值电压 不能导通

NMOS



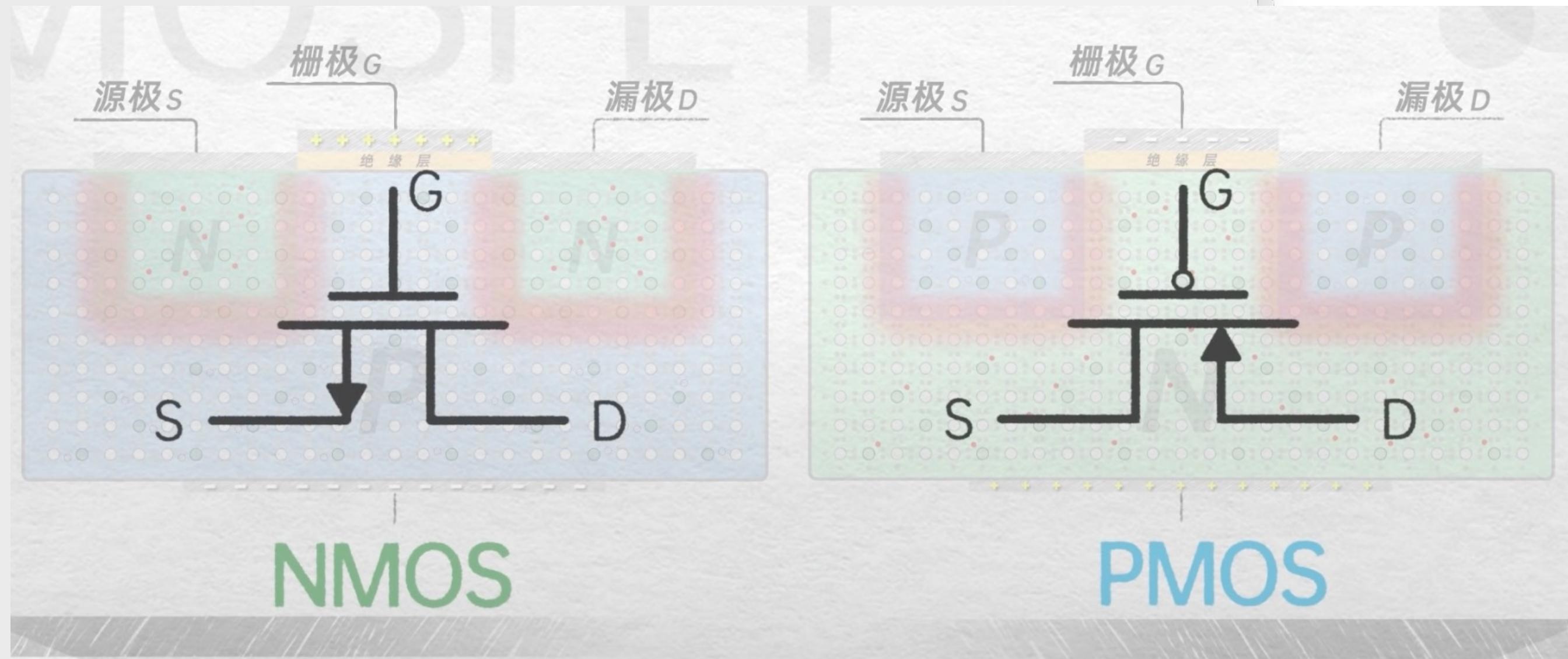
当电压高于阈值电压 不能导通
当电压低于阈值电压 可以导通

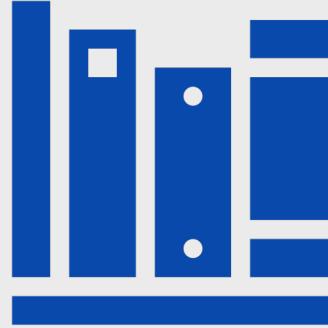
PMOS



1. CPU的设计与结构

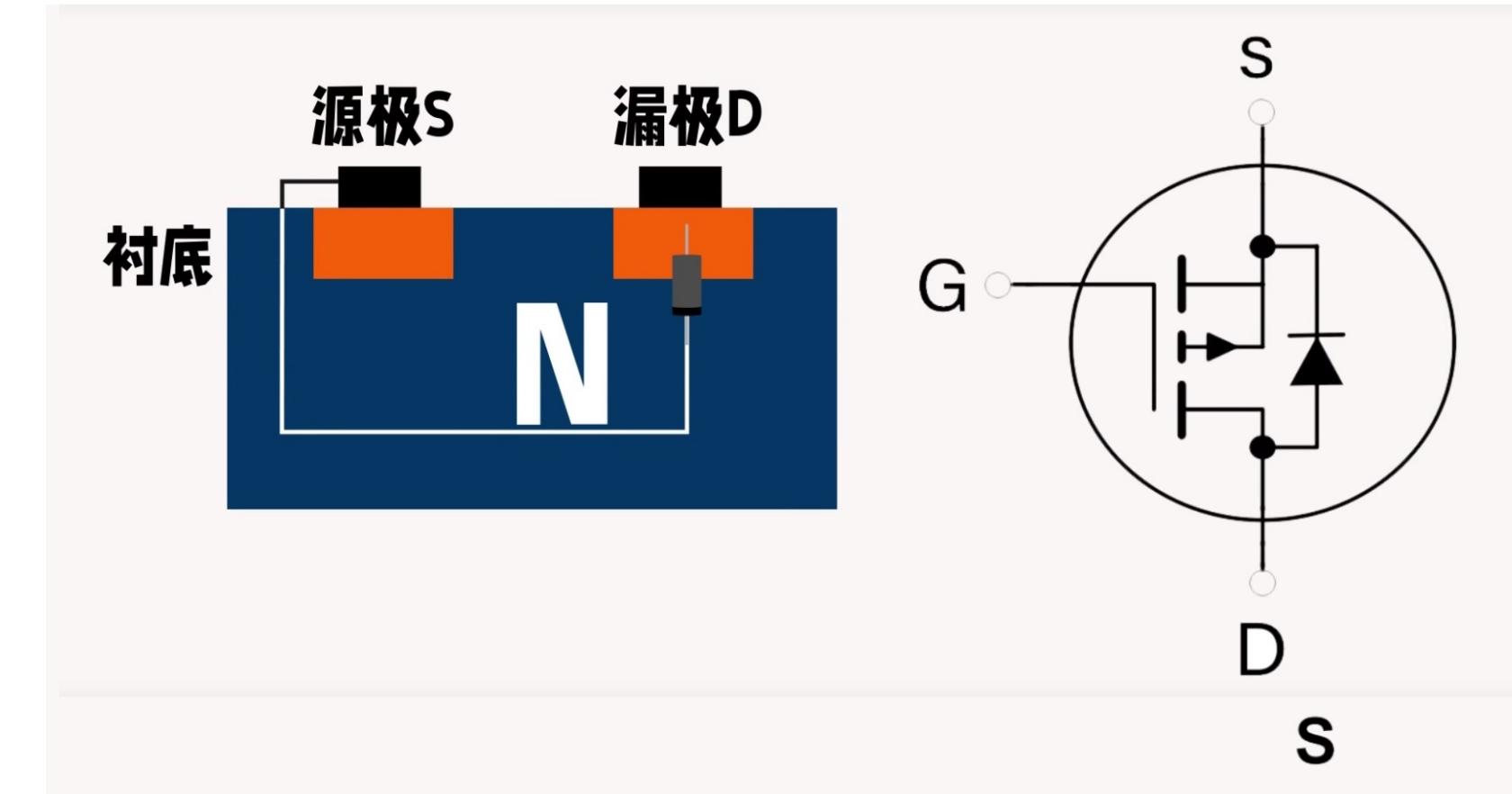
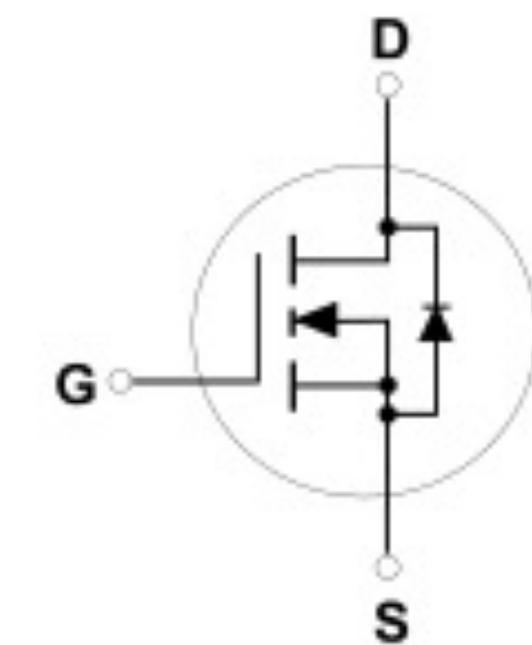
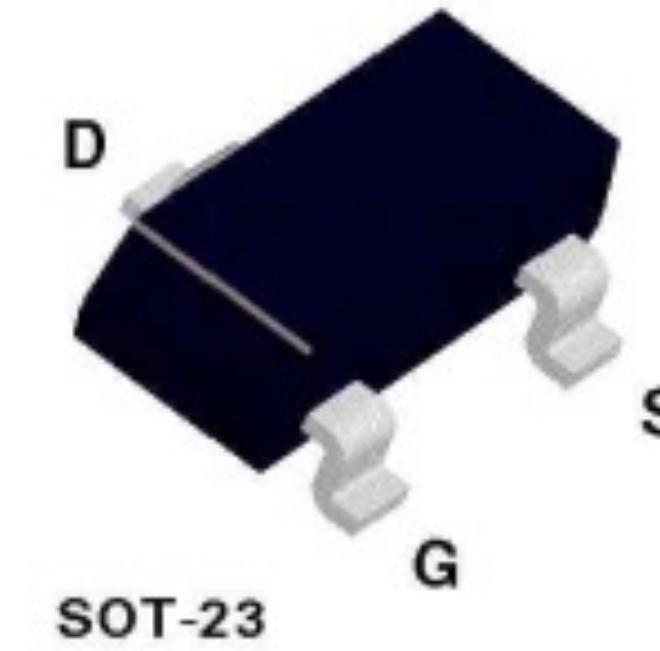
1.2.3 MOSFET的结构与工作原理



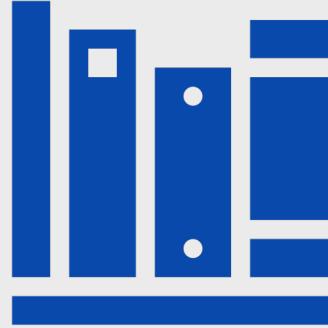


1. CPU的设计与结构

1.2.3 MOSFET的结构与工作原理

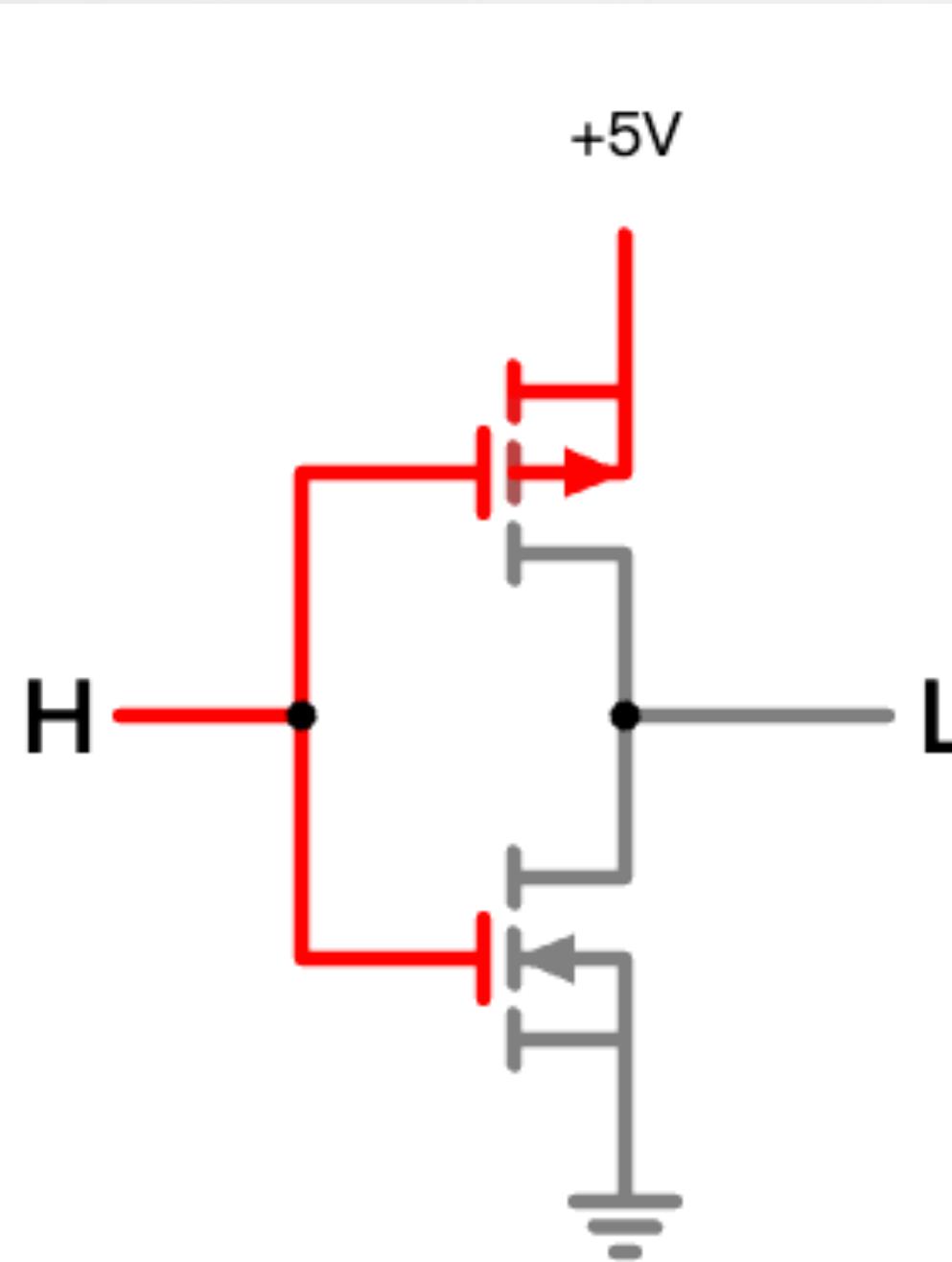


2N7002NMOS管

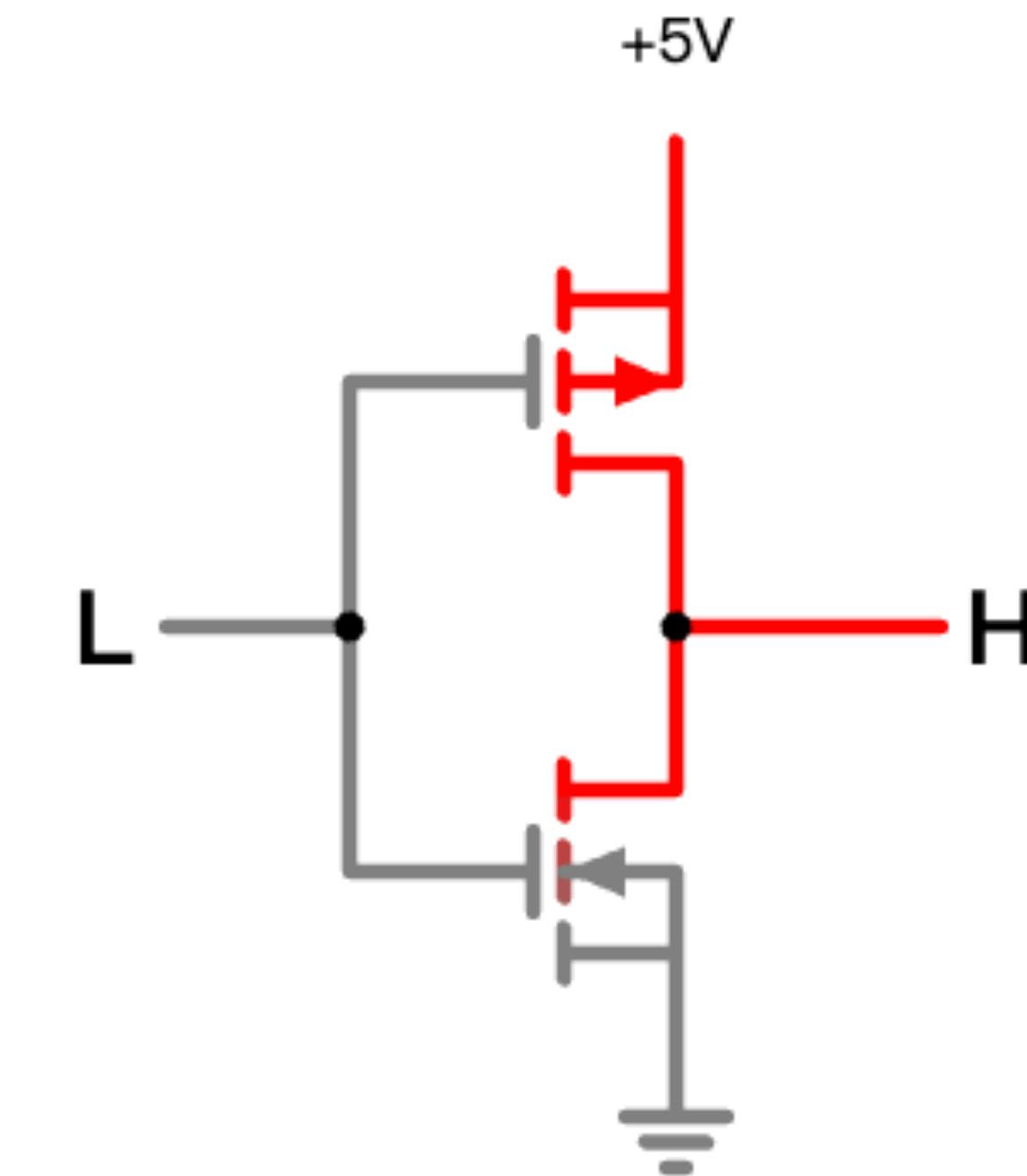


1. CPU的设计与结构

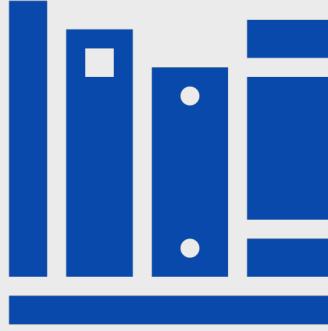
1.2.3 MOSFET的结构与工作原理



输入正向偏压
正向偏压>NMOS开启电压 V_N



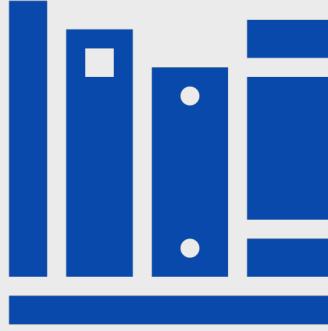
输入反向偏压
反向偏压<PMOS开启电压 V_P



1. CPU的设计与结构

1.2.3 MOSFET特性

1. 电压控制
2. 高输入阻抗
3. 响应速度快
4. 能耗低
5. 有N型和P型，工作方式相反，组合起来工作
6. 工作可靠稳定



1. CPU的设计与结构

1.2 总结

1. 逻辑控制来源于开关控制
2. 认识导体与半导体工作原理
3. MOSFET（金属氧化物半导体场效应晶体管）的
结构和工作原理

欢迎参与学习

WELCOME FOR YOUR JOINING

嵌入式宋船长