

# Logic Gates

## Diodes

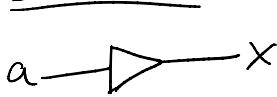
### Single Input Gates

#### Inverter

a	x
0	1
1	0



#### Buffer



a	x
0	0
1	1

### Two Input Gates

#### AND

a	b	x
0	0	0
0	1	0
1	0	0
1	1	1



#### NAND



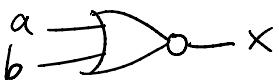
a	b	x
0	0	1
0	1	0
1	0	0
1	1	0

#### OR



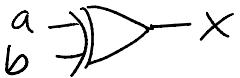
a	b	x
0	0	0
0	1	1
1	0	1
1	1	1

#### NOR



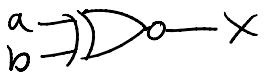
a	b	x
0	0	1
0	1	0
1	0	0
1	1	0

#### XOR



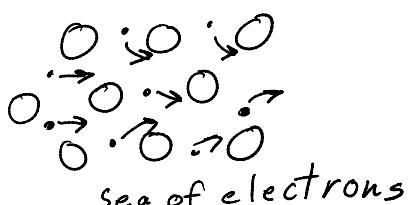
a	b	x
0	0	0
0	1	1
1	0	1
1	1	0

#### XNOR



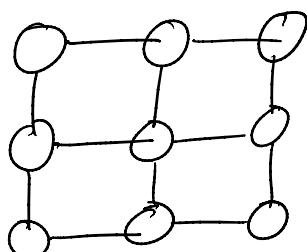
a	b	x
0	0	1
0	1	0
1	0	0
1	1	1

### Conductor

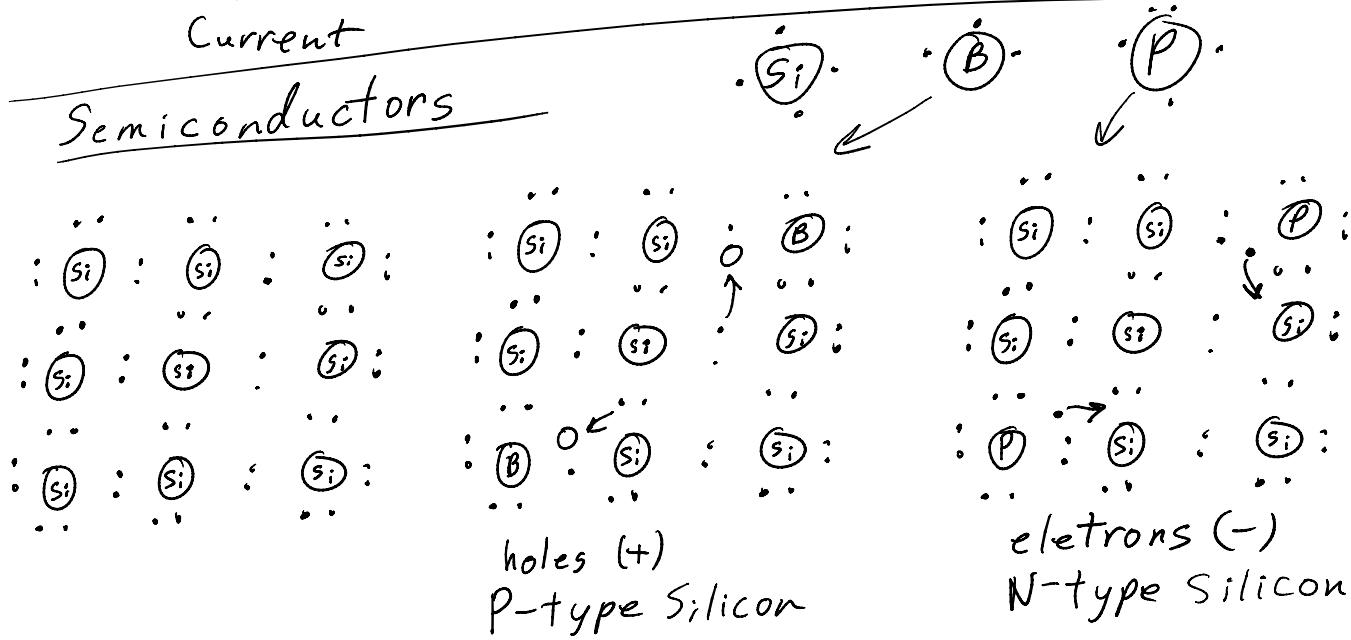


← Conventional

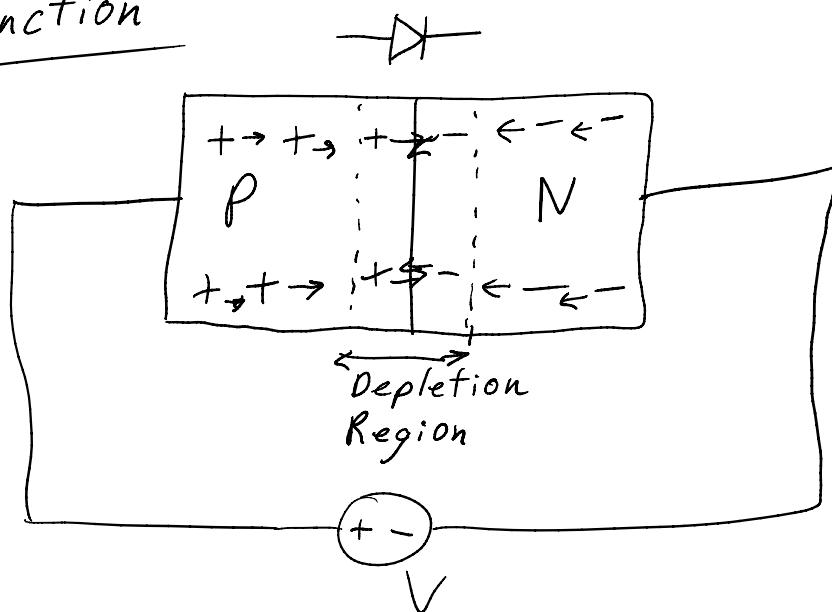
### Insulator



Conventional Current Semiconductors



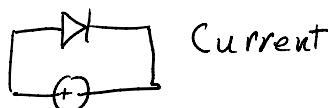
PN Junction



Reverse Bias

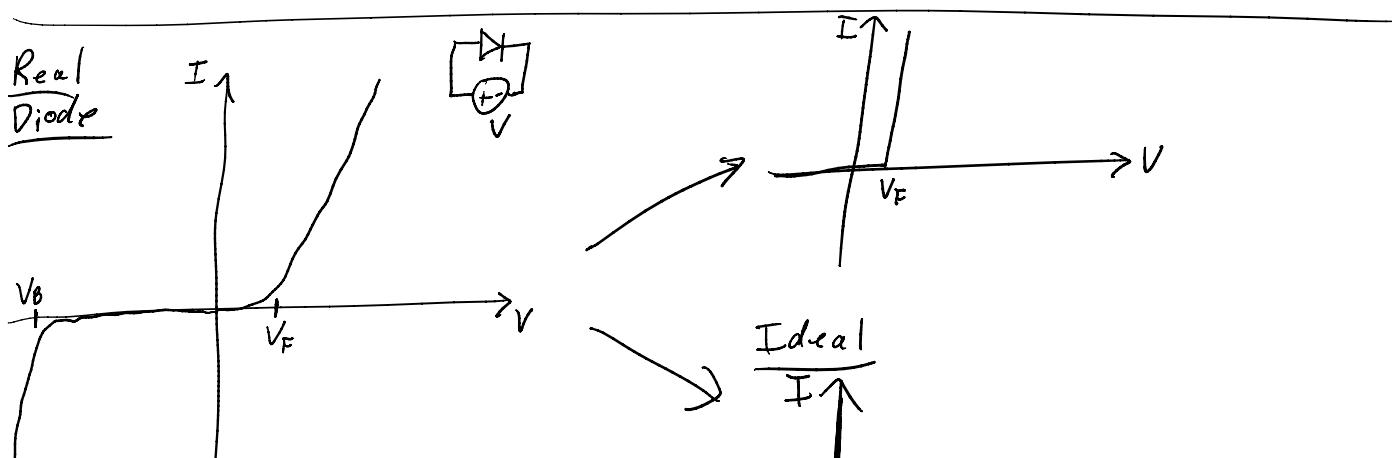


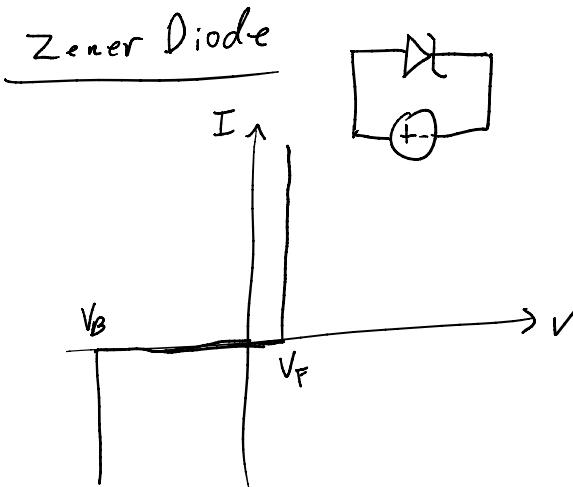
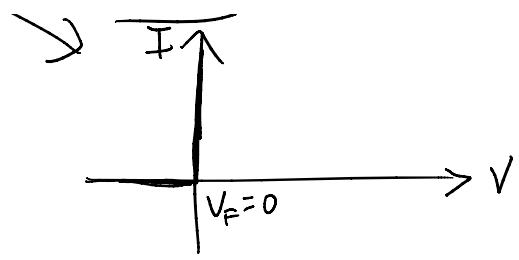
Forward Bias



Forward Voltage  
 $V_F \approx 0.6$

Ideal Diode:  $V_F = 0$





### Applications

#### Half-Wave Rectifier

