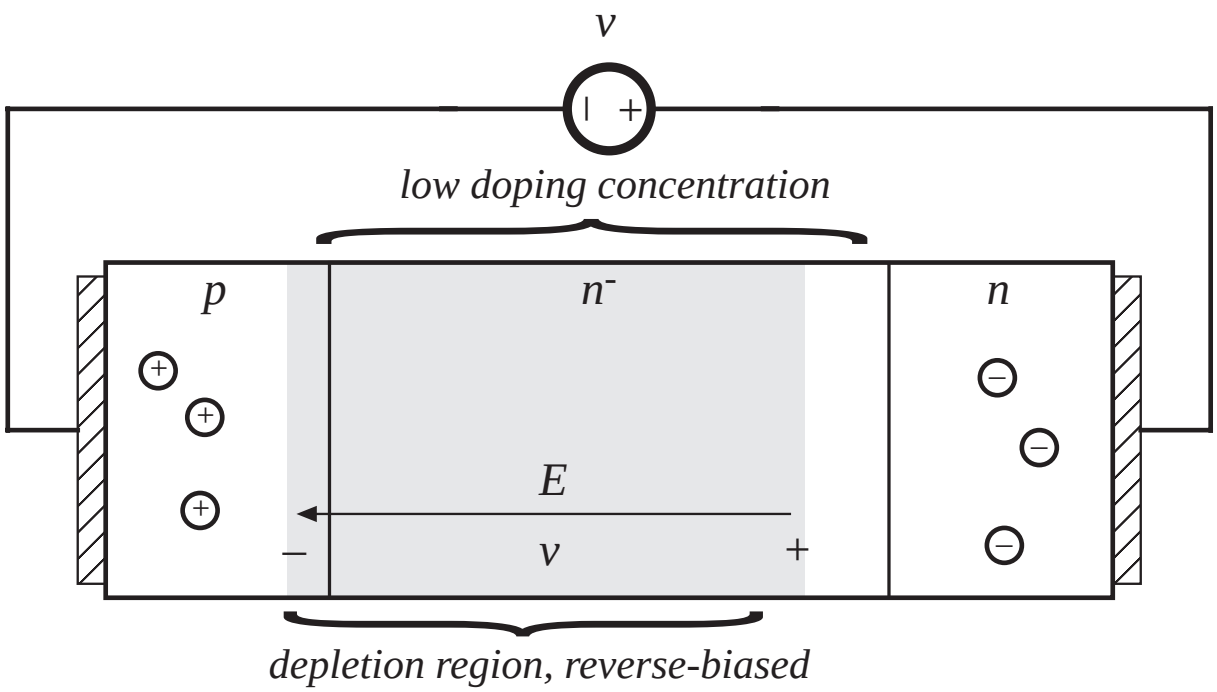
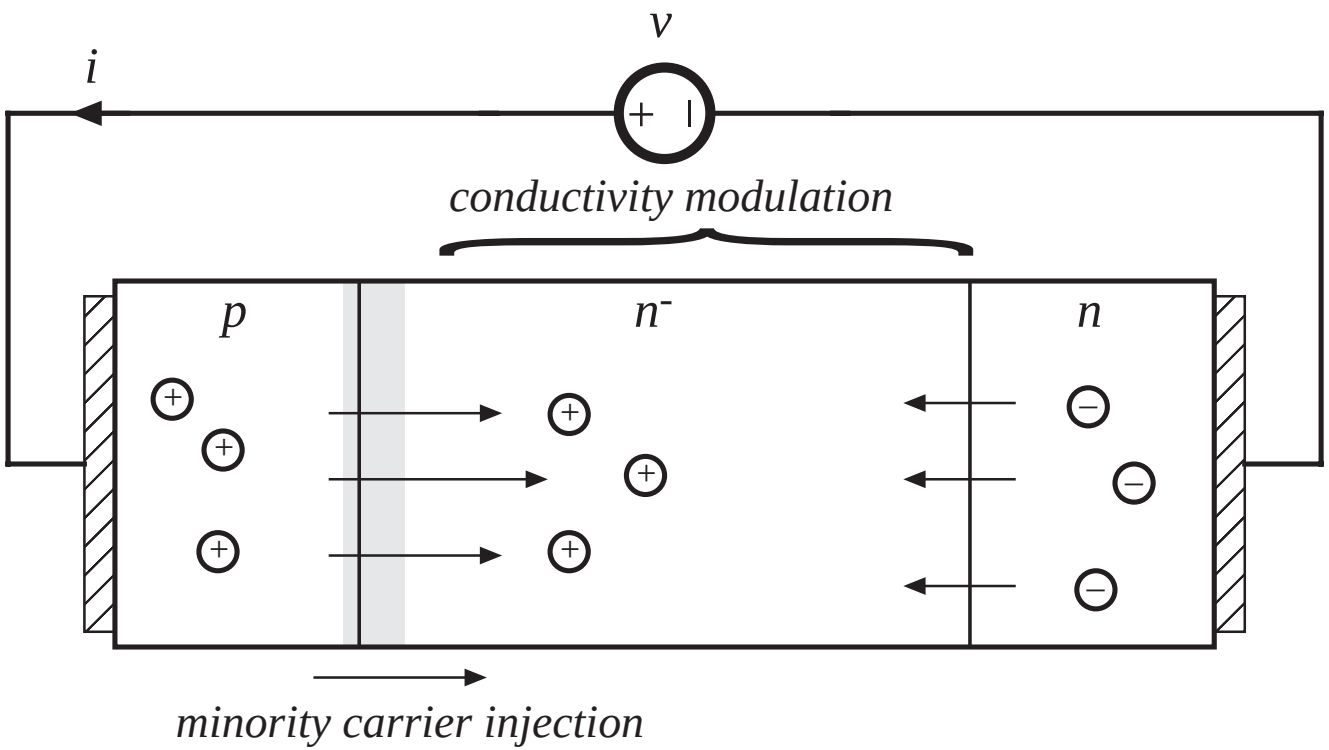
4.2.1. Power diodes

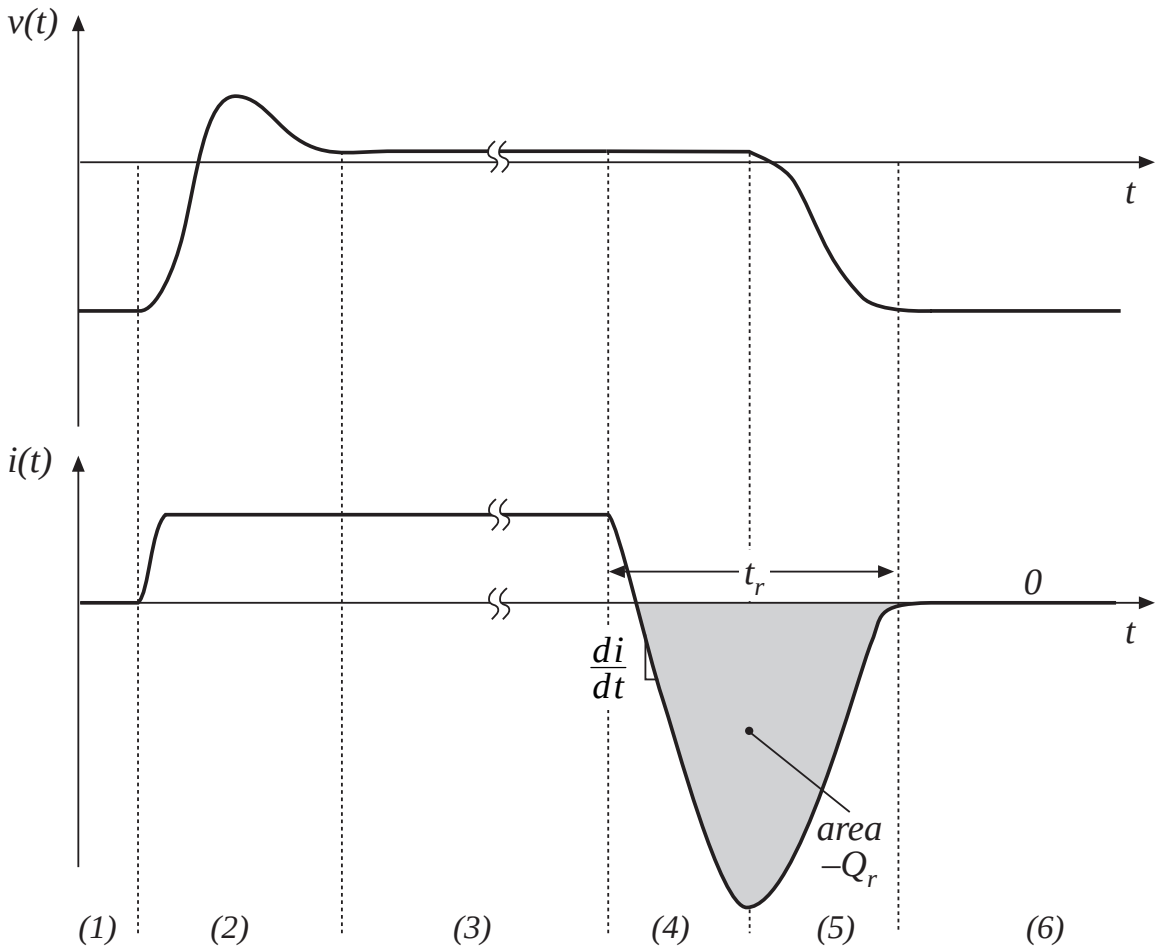
A power diode, under reverse-biased conditions:



Forward-biased power diode



Typical diode switching waveforms



Types of power diodes

Standard recovery

- Reverse recovery time not specified, intended for 50/60Hz

Fast recovery and ultra-fast recovery

- Reverse recovery time and recovered charge specified
- Intended for converter applications

Schottky diode

- A majority carrier device
- Essentially no recovered charge
- Model with equilibrium i-v characteristic, in parallel with depletion region capacitance
- Restricted to low voltage (few devices can block 100V or more)

Characteristics of several commercial power rectifier diodes

Part number	*Rated max voltage*	*Rated avg current*	V_F *(typical)*	t_r *(max)*
Fast recovery rectifiers				
1N3913	400V	30A	1.1V	400ns
SD453N25S20PC	2500V	400A	2.2V	2μs
Ultra-fast recovery rectifiers				
MUR815	150V	8A	0.975V	35ns
MUR1560	600V	15A	1.2V	60ns
RHRU100120	1200V	100A	2.6V	60ns
Schottky rectifiers				
MBR6030L	30V	60A	0.48V	
444CNQ045	45V	440A	0.69V	
30CPQ150	150V	30A	1.19V	