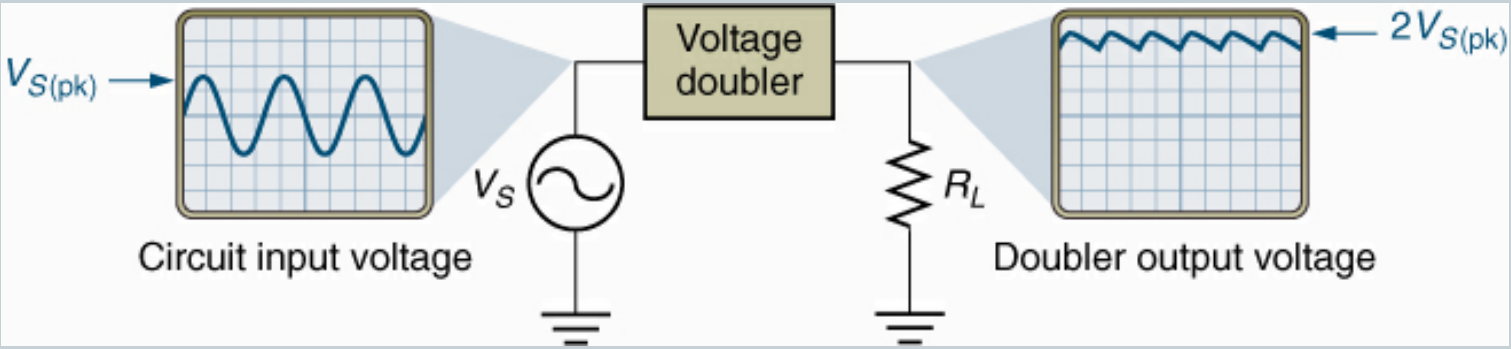
Voltage Doublers

- A voltage doubler provides an output that is twice its peak input voltage.



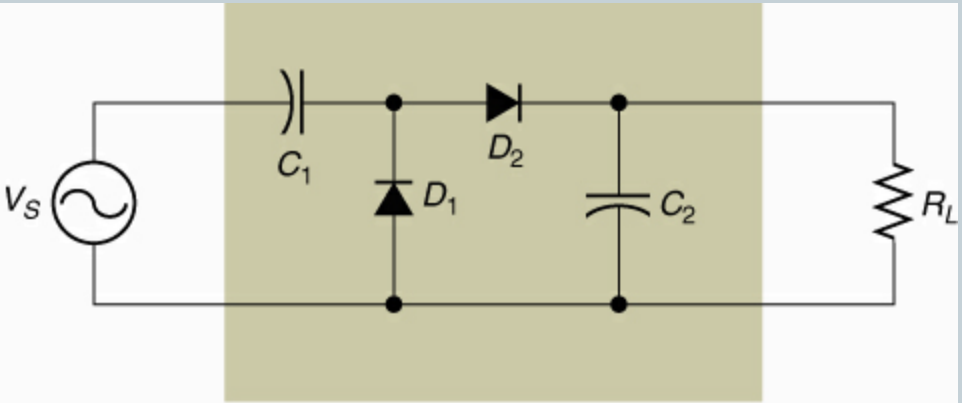
A **voltage doubler** is an electronic circuit which charges capacitors from the input voltage and switches these charges in such a way that, in the ideal case, exactly twice the voltage is produced at the output as at its input.

The simplest of these circuits are a form of rectifier which take an AC voltage as input and outputs a doubled DC voltage. The switching elements are simple diodes and they are driven to switch state merely by the alternating voltage of the input. DC to DC voltage doublers cannot switch in this way and require a driving circuit to control the switching.

- They frequently also require a switching element that can be controlled directly, such as a transistor, rather than relying on the voltage across the switch as in the simple AC to DC case.
- Voltage doublers are a variety of voltage multiplier circuit. Many (but not all) voltage doubler circuits can be viewed as a single stage of a higher order multiplier: cascading identical stages together achieves a greater voltage multiplication.

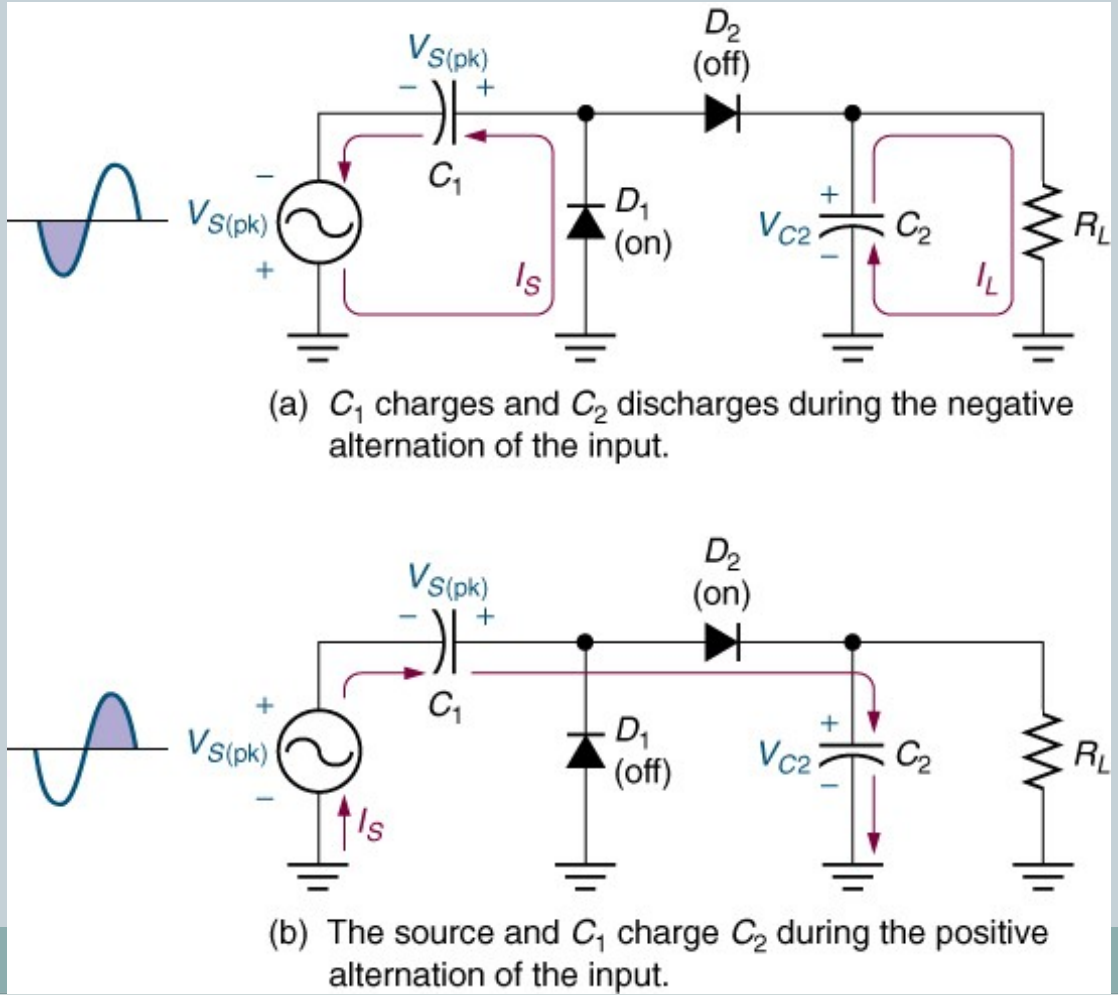
Half-Wave Voltage Doubler

- The term “half-wave” reflects the fact that the output capacitor (C_2) is charges during one alternation of each input cycle and discharges during the other.



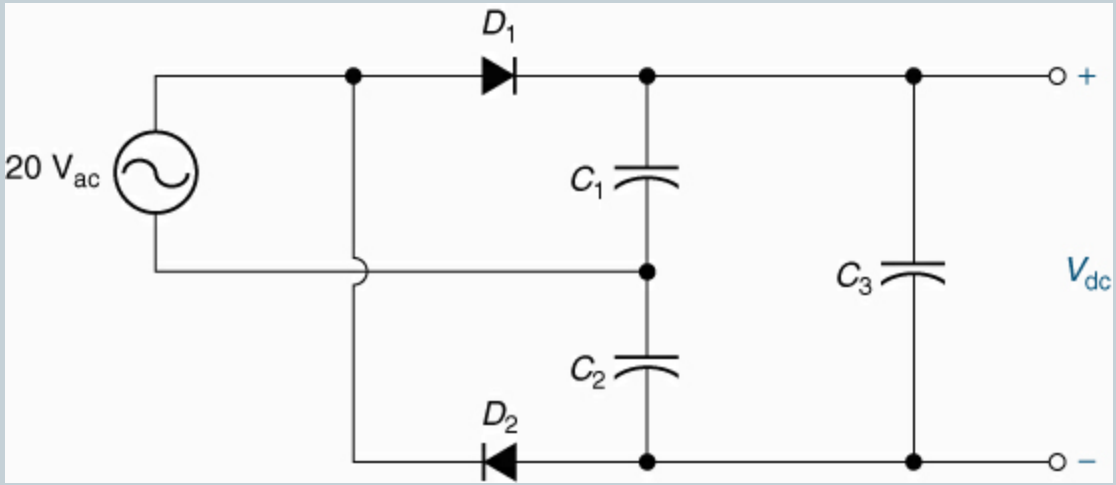
Half-wave voltage doubler

Half-Wave Voltage Doubler Operation



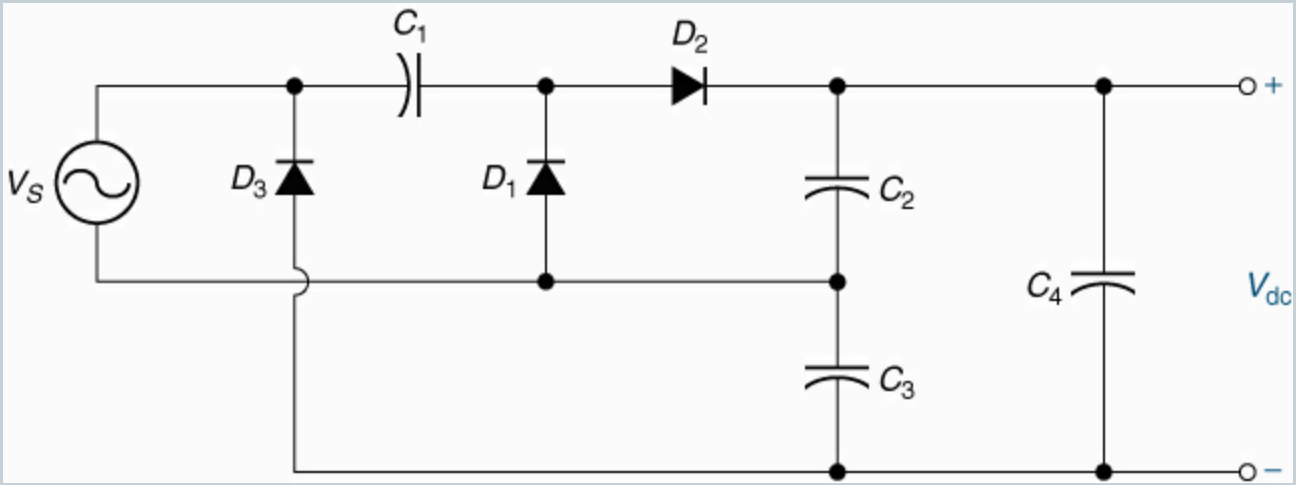
Full-Wave Voltage Doublers

- The term “full-wave” reflects the fact that the output capacitors are charged during alternate half-cycles of the input signal.



Voltage Tripler

- A voltage tripler provides a dc output voltage that is approximately three times the peak input voltage.



Thank You