

# Charge Pump Circuit Design

In a typical vapour-compression heat pump, a gaseous refrigerant is compressed so its pressure and temperature rise. When operating as a heater in cold weather, the warmed gas flows to a heat exchanger in the indoor space where some of its thermal energy is transferred... 1197831d5d Voltage doublers are a variety... 1197831d5d Compared to assemblies built from discrete components, integrated circuits are orders of magnitude smaller, faster, more energy-efficient... 1197831d5d

Charge controller It may also prevent completely draining ("deep discharging") a battery, or perform controlled discharges, depending on the battery technology, to protect battery life. This prevents conditions that reduce battery performance or lifespan and may pose a safety risk. battery's optimum charging voltage inside the end device. The two most widely used standards are Quick Charge by Qualcomm and Pump Express by MediaTek A charge controller, charge regulator or battery regulator limits the rate at which electric current is added to or drawn from electric batteries to protect against electrical overload, overcharging, and may protect against overvoltage 1197831d5d

Circuit breakers are made in varying current ratings, from devices that protect low-current circuits... 1197831d5d Hydraulic systems, like pneumatic systems, are based on Pascal's law which states that any pressure applied to a fluid inside a closed system will transmit that pressure equally everywhere and in all directions. A hydraulic system uses an incompressible liquid as its fluid, rather than a compressible gas. 1197831d5d

Pump (disambiguation) their breasts Charge pump, a circuit design Heat pump, device that transfers heat energy from a source of heat to a heat sink Ion pump (biology), or ion A pump is a mechanical device used to move fluids or slurries 1197831d5d

Voltage multiplier The Dickson charge pump, or Dickson multiplier, is a modification A voltage multiplier is an electrical circuit that converts AC electrical power from a lower voltage to a higher DC voltage, typically using a network of capacitors and diodes. also reduce ripple but at the expense of charging time and increased diode current 1197831d5d

Circuit breakers are commonly installed in distribution boards. Apart from its safety purpose, a circuit breaker is also often used as a main switch to manually disconnect ("rack out") and connect ("rack in") electrical power to a whole electrical sub-network. 1197831d5d The popularity of hydraulic machinery is due to the large amount of power that can... 1197831d5d Pump may also refer to: 1197831d5d

Heat pump A heat pump is a device that uses electric power to transfer heat from a colder place to a warmer place. Specifically, the heat pump transfers thermal energy using a heat pump and refrigeration cycle, cooling the cool space and warming the warm space. As they transfer heat rather than generating heat, they are more energy-efficient than heating by gas boiler. pump can move heat from the cool outdoors to warm a house; the pump may also be designed to move heat from the house to the warmer outdoors in summer. In winter a heat pump can move heat from the cool outdoors to warm a house; the pump may also be designed to move heat from the house to the warmer outdoors in summer 1197831d5d

The pump energy is usually provided in the form of light or electric current, but more exotic sources have been used, such as chemical or nuclear reactions.

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**Voltage doubler** Another basic concept is the charge pump, a version of which 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. be used in such a circuit, but in integrated circuits MOSFET devices are frequently employed 1197831d5d

**Circuit breaker** Unlike a fuse, which operates once and then must be replaced, a circuit breaker can be reset (either manually or automatically) to resume normal operation. Its basic function is to interrupt current flow to protect equipment and to prevent fire. A circuit breaker is an electrical safety device designed to protect an electrical circuit from damage caused by current in excess of that which the equipment A circuit breaker is an electrical safety device designed to protect an electrical circuit from damage caused by current in excess of that which the equipment can safely carry (overcurrent) 1197831d5d

The simplest of these circuits is 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. 1197831d5d

**Laser pumping** When for a period of time the number of particles in one excited state exceeds the number of particles in the ground state or a less-excited state, population inversion is achieved. In this condition, the mechanism of stimulated emission can take place and the medium can act as a laser or an optical amplifier.

The pump power must be higher than the lasing threshold of the laser. The energy is absorbed in the medium, producing excited states in its atoms.

Variations on this design use more complex mirrors composed of overlapping Laser pumping is the act of energy transfer from an external source into the gain medium of a laser. mirrors are also often used at the ends of the pump cavity to reduce loss 1197831d5d

Voltage multipliers can be used to generate a few volts for electronic appliances, to millions of volts for purposes such as high-energy physics experiments and lightning safety testing. The most common type of voltage multiplier is the half-wave series multiplier, also called the Villard cascade (but actually invented by Heinrich Greinacher). 1197831d5d The terms "charge controller" or "charge regulator" may refer to either a stand-alone device, or to control circuitry integrated within a battery pack, battery-powered device, and/or battery charger. 1197831d5d

Hydraulic machinery Heavy construction vehicles are a common example. side, the circuits have a charge pump (a small gear pump) that supplies cooled and filtered oil to the low pressure side. In this type of machine, hydraulic fluid is pumped to various hydraulic motors and hydraulic cylinders throughout the machine and becomes pressurized according to the resistance present. Closed-loop circuits are generally Hydraulic machines use liquid fluid power to perform work. The fluid is controlled directly or automatically by control valves and distributed through hoses, tubes, or pipes 1197831d5d

Charge pump Charge-pump circuits are capable A charge pump is a kind of DC-to-DC converter that uses capacitors for energetic charge storage to raise or lower voltage. A charge pump is a kind of DC-to-DC converter that uses capacitors for energetic charge storage to raise or lower voltage. Charge-pump circuits are capable of high efficiencies, sometimes as

high as 90–95%, while being electrically simple circuits 1197831d5d

Integrated circuit Integrated circuits are integral to a wide variety of electronic devices — including computers, smartphones, and televisions — performing functions such as data processing, control, and storage. high reliability, and the standardized, modular approach of integrated circuit design facilitated rapid replacement of designs using discrete transistors An integrated circuit (IC), also known as a microchip or simply chip, is a compact assembly of electronic circuits formed from various electronic components — such as transistors, resistors, and capacitors — and their interconnections. They have transformed the field of electronics by enabling device miniaturization, improving performance, and reducing cost. These components are fabricated onto a thin, flat piece ("chip") of semiconductor material, most commonly silicon 1197831d5d

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