

## Glossary of Power Supply Terms

<b>AC-DC Converter</b>	A system that converts AC current from the wall outlet into the DC currents required by electronic circuits.
<b>Ambient Temperature</b>	The still-air temperature of the immediate environment measured a minimum of 100mm from the power supply.
<b>Amps</b>	(Amperes) Unit of measurement of electromotive current (A).
<b>Basic Insulation</b>	According to international safety standards (eg UL1950, EN60950) basic insulation provides basic protection against electric shock. In contrast, operational insulation is needed for the correct operation of the equipment, but does not protect against electric shock. Quite frequently, safety standards call for basic insulation between secondary circuits.
<b>Bridge</b>	Rectifier circuit incorporating four diodes (full-bridge) or two diodes (half-bridge). Converter or chopper section of switching power supplies incorporating four transistors (full-bridge) or two transistors (half-bridge).
<b>Brownout</b>	Condition during peak usage periods when electric utilities reduce their nominal line voltage by 10% to 15%.
<b>Brownout Protection</b>	The ability of a power supply to continue operating within specification through the duration of a brownout.
<b>Burn In</b>	The period directly following the very first turn-on of a given power supply. It is characterized by a relatively high and declining failure rate.
<b>Bus</b>	The system of conductors (wire, cable, copper bars, etc.) used to transport power from the power supply to the load. A communications structure used to control various instruments and subsystems.
<b>CB Report</b>	Document necessary for the mutual recognition of approvals between different national test norms.
<b>Constant Current Limiting Circuit</b>	Current-limiting circuit that holds output current at some maximum value whenever an overload of any magnitude is experienced.
<b>Constant Voltage</b>	A power supply that regulates voltage level regardless of changes in load resistance.
<b>Convection</b>	The transference of thermal energy in a gas or liquid by currents resulting from unequal temperatures.
<b>Current</b>	Rate of transfer of electrical charge measured in amperes (A)
<b>Current Limiting Circuit</b>	A circuit designed to prevent overload of a constant-voltage power supply. It can take the form of constant, foldback or cycle-by-cycle current limiting.
<b>DC</b>	Direct Current or unidirectional voltage or current
<b>Dynamic Load</b>	A load that rapidly changes from one level to another. To be properly specified both the total change and the rate of change must be stated.
<b>Efficiency</b>	The ratio of total output power to total input power, expressed as a percentage, under specified conditions.
<b>EMC (Electromagnetic Compatibility)</b>	Any electromagnetic effect: Emissions from elements within apparatus (motors, converters, choppers), disturbance of elements and measures for improving the functionality.
<b>EMI (Electromagnetic Interference)</b>	Also called radio-frequency interference (RFI), EMI is unwanted high frequency energy caused by the switching transistors, output rectifiers, and zener diodes in switching power supplies. EMI can be conducted through the input or output lines or radiated through space.
<b>ESR (Equivalent Series Resistance)</b>	The amount of resistance in series with an ideal (lossless) capacitor, which duplicates the performance of a real capacitor. In general, the lower the ESR, the higher the quality of the capacitor and the more effective it is as a filtering device. ESR is a prime determinant of ripple in switching power supplies.
<b>FCC (Federal Communications Commission)</b>	United States federal regulating body whose new EMI limitations are affecting the design and production of digital electronics systems and their related subassemblies, such as power supplies.

<b>Filter</b>	A frequency-sensitive network that attenuates unwanted noise and ripple components of a rectified output.
<b>Ground Loop</b>	An unwanted feedback problem caused by two or more circuits sharing a common electrical line, usually a common ground line.
<b>Head Room</b>	In a linear regulator, the head room is the difference between the secondary voltage supplied by the power transformer at nominal input voltage and the regulated output voltage. Head room is necessary to ensure proper regulation under full load and low input voltage operation.
<b>IEC (International Electrotechnical Commissions)</b>	An international safety agency headquartered in Geneva, Switzerland.
<b>Input Voltage Range</b>	The range of source voltages for which the power supply meets its specifications.
<b>Inrush Current</b>	A high surge of input current that occurs in switchers and occasionally in linears upon initial turn on, caused by charging of the input capacitors.
<b>Insulation</b>	Material used to insulate a device by preventing or reducing the transmission of electricity.
<b>Leakage Current</b>	Current flowing between the output buses and chassis ground due to imperfections in electronic components and designs. It must be tightly controlled to satisfy safety regulations such as UL and VDE.
<b>Line Regulation</b>	The variation of an output voltage due to a change in the input voltage, with all other factors held constant. Line regulation is expressed as the maximum percentage change in output voltage as the input voltage is varied over its specified range.
<b>Linear Power Supply</b>	A PSU that regulates the output parameter (usually output voltage) by varying voltage drop across an electronic component placed in series with the load which dissipates unused power. This component may be a power semiconductor or a resistor. The regulation is accomplished by changing its effective resistance (if it is a power semiconductor) or by forcing extra current through it (if it is a resistor).
<b>Linear Regulator</b>	A common voltage stabilization technique in which the control device (usually a transistor) is placed in series or parallel with the power source to regulate the voltage across the load. The term "linear" is used because the voltage drop across the control device is varied continuously to dissipate unused power.
<b>Load</b>	For voltage regulated power supplies, the load is the output current.
<b>Load Regulation</b>	Variation of the output voltage due to a change in the output's load within a specified range with all other factors held constant. It is expressed as a percentage of the nominal DC output voltage.
<b>Modular</b>	A physically descriptive term used to describe a power supply made up of a number of separate subsections, such as an input module, power module, or filter module. Modular construction tends to lower the MTBF.
<b>MTBF</b>	This measurement, expressed in hours, gives the relative reliability, and can be based on actual operation or on a calculated standard.
<b>Multiple Output Supply</b>	A power supply that delivers two or more different output voltages.
<b>Noise</b>	A periodic, random component of undesired deviations in output voltage. Usually specified in combination with ripple.
<b>Nominal Output Volatage</b>	The intended, ideal voltage of any given output.
<b>Open-Frame Construction</b>	A construction technique common to OEM power supplies where the supply is not provided with an enclosure. It can be either a simple printed circuit board or circuit board mounted on a metal chassis without a cover.
<b>Operating Temperature</b>	The range of temperatures within which a power supply will perform within specified limits.
<b>Output Impedance</b>	The value of a fictional resistor in series with an ideal voltage source that would give the same magnitude of AC voltage across the supply terminals as observed for a particular magnitude and frequency of alternating current.

<b>Output Voltage</b>	The voltage measured at the output terminals of a power supply
<b>Post Regulator</b>	Usually a linear regulator used on the output of a switching power supply to improve overall (load) regulation.
<b>Power Factor</b>	The ratio of actual power used in a circuit to the apparent power. Power factor is the measure of the fraction of current in phase with the voltage and contributing to average power.
<b>Power Supply</b>	A device that transfers electric energy from the source to the load using electronic circuits. A common application of power supplies is to convert raw input power into a regulated voltage and/or current required for electronic equipment.
<b>Pre-Regulator</b>	A regulator circuit that provides a line-regulated output, which is then processed by a second regulator, the post-regulator, which provides load regulation.
<b>Push-Pull Converter</b>	Used in switching power supplies where the main switching circuit uses two transistors operating in push-pull. The main advantage is simplicity of design.
<b>Pulse Width Modulation</b>	A circuit used in switching regulated power supplies where the switching frequency is held constant and the width of the power pulse is varied, controlling both line and load changes with minimal dissipation.
<b>Rated Output Current</b>	The maximum continuous load current a power supply is designed to provide under specified operating conditions.
<b>Recovery Time</b>	The time required by a transient over or under shoot in a stabilized output quantity to decay within specified limits.
<b>Regulated Power Supply</b>	A PSU that maintains a given output parameter (usually output voltage) to within specified limits under varying operating conditions, such as input line, output load, ambient temperature. PSU can be linear or switched-mode (switching) depending on the method of regulation and mode of operation of power handling components.
<b>Regulator</b>	The part of a power supply that controls the output voltage. In most cases, the regulator acts to stabilize the output voltage at a preset value.
<b>Sequencing</b>	Controlling the time delay and order of output voltage appearance and drop-out upon power supply turn on and turn off.
<b>Series Regulator</b>	A linear regulator in which the active control element (transistor) is in series connection with the load.
<b>Soft Start</b>	Input surge-current limiting in a switching power supply where the switching drive is slowly ramped on.
<b>Stability</b>	The change in output voltage of a power supply over a specific period of time, following a warm up period, with all other operating parameters such as line, load and ambient temperature held constant.
<b>Standby Current</b>	The input current drawn by any power supply under minimum load conditions.
<b>Static Load</b>	A load that remains constant over a given time period. It is usually specified as a percentage of full load.
<b>Switched-Mode Power Supply</b>	A PSU that incorporates power handling electronic components that are continuously switching on and off with high frequency in order to provide the transfer of electric energy. By varying duty cycle, frequency or a phase of these transitions an output parameter is controlled. Typical frequency range of SMPS is from 20 kHz to several MHz. The actual choice of operating frequency is usually the trade off between size and efficiency.
<b>Switching Regulator</b>	A high-efficiency non-isolated DC to DC converter consisting of inductors and capacitors to store energy and switching elements (typically transistors or SCRs), which open and close as necessary to regulate voltage across a load. The switching duty cycle is generally controlled by a feedback loop to stabilize the output voltage.
<b>Temperature Coefficient</b>	The average percentage of change in output voltage per degree change in temperature with load and input voltage held constant.



<b>Thermal Protection</b>	A protective feature that shuts down a power supply if its internal temperature exceeds a predetermined limit.
<b>Thermistor</b>	A device with relatively high electrical resistance when cold and almost no resistance when at operating temperature. Thermistors are sometimes used to limit inrush current in off-line switchers.
<b>Topology</b>	Topology is the fundamental circuit design of a clearly identifiable and characteristic type. DC-DC converters can be designed along several different topologies (using different fundamental design principles). A patent for a particular topology can be very powerful in that it can encompass any circuit solution regardless of power output, falling within the design principles of the topology in question.
<b>Transformer</b>	A magnetic device that converts AC voltages to AC voltages at any level. An ideal transformer is a lossless device in which no energy is lost and that requires no magnetizing current.
<b>UL (Underwriters' Laboratories)</b>	An independent, non-profit organization testing for public safety in the United States.
<b>Volt</b>	Unit of measurement of electromotive force, electric potential or potential difference (V).
<b>Warm Up Time</b>	The time needed, after turn on, for the power supply to reach thermal equilibrium with a constant load. Usually estimated to be about 30 minutes.
<b>Watt</b>	Unit of measurement of power equal to 1 joule/sec (W). DC power can be calculated by multiplying voltage and current.