

## Glossary of Terms

A	
<b>Agency Approval</b>	UL, CSA and TUV are safety agencies that test specifications such as component spacing, hi-pot isolation, leakage currents, circuit board flammability and temperature rating. Hi-pot (high-potential) isolation is the ability to accept voltage surges with safety.
<b>Ambient Temperature</b>	Average temperature of the environment directly surrounding the power supply.
<b>Ampere(A)</b>	Unit of measurement for electrical current or rate of flow of electrons (Coulombs/sec) through a wire. The symbol for electrical current is "I".
<b>Apparent Power</b>	Power Value obtained in an AC circuit as the product of <u>RMS current x RMS voltage</u>
<b>ATX</b>	Advanced technology Extended (Term introduced by Intel) is a form factor. A full size ATX board is 305mm wide by 244mm deep (12" x 9.6"). An ATX power supply does not directly connect to the system power button, allowing the computer to be turned off via software. Many ATX power supplies have a manual switch on the back to ensure the computer is truly off and no power is being sent to the components. ATX used one large, keyed connector instead, making a reversed connection very difficult.
<b>AWG(American Wire Gauge aka. Browne &amp; Sharpe wire Gauge)</b>	Standard for sizing cross sectional areas of wire and measure sheet-meta thickness. The cross-sectional area of each gauge is an important factor for determining its current carrying capacity. The numbers are retrogressive where a larger number denotes a smaller wire.
B	
<b>Boost Regulator</b>	A topology for switching power supplies where energy from the input is stored in an inductor during the pulse then released to the output after the pulse. This renders the output to be always greater than the input voltage.
<b>Bridge Rectifier</b>	Full-wave rectifier circuit employing multiple rectifiers in a bridge configuration to rectify single-phase or multi-phase AC power.
<b>Buck Regulator</b>	A topology for switching power supplies where a series of pulses control a switching device that switches the input on/off, and an averaging L-C filter that conveys the energy to a load. This renders output voltage to be less than the input voltage.
<b>Buck-Boost Regulator</b>	A topology for switching power supplies where a series of pulses control a switching device that delivers energy to an inductor that stores the energy and later delivers it to a load. This renders the output voltage to be less than the input voltage.
<b>Bulk Capacitor</b>	Energy storage capacitor at the front or the load end of a regulator.
C	
<b>Capacitor</b>	Device that stores electrical charge. A simple capacitor consists of two conducting surfaces separated by a dielectric. Capacitance is measure by Farads (F).
<b>Clearance Distance</b>	The shortest path separating two conductors or two circuit components
<b>Common mode noise</b>	The component of noise voltage that appears equally and in phase on conductors relative to a common reference.
<b>Compliance</b>	Agency certification that a product meets its standard.
<b>Conformal Coating</b>	An insulating layer that can be applied by spraying, dipping or vapour deposition that covers and protects the components on a circuit board.
<b>Constant Current Power Supply</b>	Power supply that regulates its output current, within specified limits, against changes in line voltage, load, ambient temperature and time.
<b>Constant Voltage Power Supply</b>	Power supply that regulates its output voltage within specified limits, against changes in line voltage, load, ambient temperature and time.
<b>Convection cooled power supply</b>	Power supply that is cooled only from the <u>natural</u> motion of a gas or liquid over the surface of heat dissipating elements.
<b>Creepage Distance</b>	The shortest distance separating two conductors as measured along an insulating surface touching both conductors.

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<b>Cross Regulation</b>	In a multiple output power supply, the percent voltage change at one output caused by the load change on another output.
<b>Current</b>	The rate of transfer of electrical charge measured in Amperes (A). The sign for current is “I”.
<b>D</b>	
<b>DC</b>	Direct Current, Electrical current that flows in a single direction.
<b>DC/DC Converter</b>	A circuit or device that changes a DC input to a DC output of a different voltage (or in some cases the same).
<b>Demonstrated MTBF</b>	The most accurate type of MTBF rating is “demonstrated MTBF”. Demonstrated MTBF ratings are developed by analyzing the failures for a group of units that has been operating in actual field service over an extended period of time (typically several years). Consequentially, demonstrated MTBF is a statement of historical fact.
<b>Derating</b>	Reduction in the power output of a power supply due to external environmental factors such as ambient temperature in order to insure proper functioning of the part.
<b>DIN Rail</b>	Standardized mounting scheme for electrical and electronic components.
<b>DIP</b>	Dual Inline Package
<b>Duty Cycle</b>	Time interval occupied by a device on intermittent duty in starting, running, stopping and idling.
<b>Driver</b>	An amplifier used for control of another device or circuit.
<b>E</b>	
<b>Efficiency</b>	Ratio of total output power to total input power, expressed as percentage, under specified conditions, normally at full load under nominal input voltage.
<b>Electromagnetic Interference (EMI)</b>	Noise generated by the switching action of the power supply and other system components. Conducted EMI is radiation reflected back into the power line, which is normally controlled with a line filter. Radiated EMI is that portion that would radiate into free space, but is suppressed by enclosing a power supply's circuitry in a metal case. The FCC governs conducted and radiated emission levels in the U.S.
<b>EMC</b>	Electromagnetic compatibility
<b>EMI Filter</b>	Circuit composed of reactive and resistive components for the reduction of electromagnetic interference being emitted from a power supply.
<b>EMS</b>	Electromagnetic susceptibility
<b>F</b>	
<b>Fall Time</b>	Time required for a pulse to decrease from 90% to 10% of its peak.
<b>Fan Rating</b>	Airflow rated in cubic feet per minute. A 100% increase in airflow will reduce system operating temperatures by 50% relative to ambient temperature. For each 18 degrees (Fahrenheit) of reduction, the life of the system is doubled (Arrhenius equation).
<b>Farad (F)</b>	Unit of measurement for capacitance
<b>Filter</b>	One or more discrete components positioned in a circuit to diminish signal energy in a specified band of frequencies.
<b>FMEA</b>	<b>Forced Convection Cooling</b>
<b>Frequency(Hz)</b>	Number of periods per second.
<b>Forced Air Cooling</b>	Heat transfer by moving a cooling medium with the help of a fan or pump.
<b>Full Load</b>	The maximum specified output load for a converter under continuous operating conditions.
<b>G</b>	
<b>GMP</b>	Good Manufacturing Practices (Quality System for Manufacturing)
<b>Ground</b>	Conducting connection to earth(or virtual earth; note virtual ground)

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<b>H</b>	
<b>Heat Sink</b>	Mechanical structure through which thermal energy is transferred between a device and an external cooling medium.
<b>Henry (H)</b>	Unit of measurement for Inductance. A coil has one Henry of inductance if and EMF of one volt is induced is induced when current through an inductor is changing at a rate of 1 Ampere per Second.
<b>Hertz (Hz)</b>	Unit of measurement for frequency; equivalent to 1 cycle per Second.
<b>Hiccup Mode</b>	An operating mode of a power converter in which the converters cycles on/off after being triggered by an output fault condition.
<b>Hi-pot Test</b>	A dielectric test performed by applying a high voltage for a specified time of two isolated points in a device to determine adequacy of insulating materials.
<b>Hold-up Time</b>	Time period that a power supply's output will remain within specified limits, following power disturbances or a loss of input power. Adequate hold-up time keeps the computer running until a standby UPS takes over within a few milliseconds.
<b>I</b>	
<b>IC</b>	Integrated Circuit
<b>IEC</b>	International Electrotechnical Commission
<b>Inductance (L)</b>	Property of an electric circuit by virtue of which a varying current induces an electromotive force in that circuit or a neighbouring one.
<b>Input Current</b>	Current that a device draws from the input power bus under nominal operating conditions.
<b>I/O ( Input/Output) Isolation</b>	Circuit techniques that provide DC voltage isolation between input and output circuitry of a power supply.
<b>Inrush Current</b>	Peak instantaneous input current drawn by a circuit at turn-on or application of input power.
<b>Integrated Circuit (IC)</b>	Combination of several active/passive circuit elements contained on a single semiconductor substrate.
<b>Inverter</b>	Power supply that produce AC output from a DC input.
<b>Isolation</b>	The electrical separation between input and output of a circuit.
<b>J</b>	
<b>Joule (J)</b>	Unit of energy equal to one watt-second.
<b>L</b>	
<b>LC Filter</b>	Also know as an averaging filter. A low pass filter that consists of a capacitor and an inductor.
<b>Leakage Current</b>	The AC or DC current flowing from input to output of an isolated device at a specified voltage.
<b>LED</b>	Light Emitting Diode which is a semiconductor light source.
<b>Line Regulation</b>	Change in output voltage due to varying input voltage. Expressed as a percent of the normal output voltage, a power supply with tight line regulation delivers optimum voltages throughout the operating range. This is tested by measuring the difference in output voltages while varying the input voltage from minimum to maximum, i.e., from 85 to 135 volts.
<b>Linear Regulator</b>	An active device connected in series or shunt with the load of a power supply to maintain a constant output voltage or current.
<b>Load</b>	Any combination of resistance, capacitance, inductance which is connected at the output terminals of a power source and thus determines power used.

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<b>Load regulation</b>	Change in output voltage due to a varying load. Expressed as a percent of the normal output voltage, a power supply with tight load regulation delivers optimum voltages regardless of system configuration. This is tested by measuring the difference in output voltage when applying a light load and a heavy load.
<b>Maximum Load</b>	The highest allowable power output specified for the outputs of a power converter under certain conditions.
<b>Maximum Operating Temperature</b>	Highest Ambient Temperature at which a power supply will operate safely within technical parameters
<b>MTBF(Mean Time Between Failure)</b>	The mean length of time between device failures, this does not include infant mortality and related end of life. Calculated method can be describe in the Mil Handbook 217
<b>M</b>	
<b>Minimum Load</b>	Lowest current to be drawn on a constant voltage power supply for the voltage to be in specified range(if constant current supply then it is max value of load resistance)
<b>Minimum Operating Temperature</b>	Lowest ambient temperature where a power suppl will turn on and operate properly
<b>MLCC</b>	Multi Layer Ceramic Capacitor
<b>Modular</b>	Power converter made to standard dimensions and capable of being integrated directly with other units in a larger system.
<b>MSL</b>	Moisture Sensitivity Level
<b>N</b>	
<b>No Load Current</b>	When the DC/DC converter is switched "ON" using the control pin (internal oscillator is working) without any load connected. Normally this current is in milliamps.
<b>No Load Voltage</b>	Voltage at the output when no urrent is flowing in the external circuit
<b>Noise</b>	Unwanted electronic signal superimposed on the output
<b>Nominal value</b>	Specified normal value of a quantity
<b>O</b>	
<b>Off Idle Current</b>	When the DC/DC converter is switched "OFF" using the control pin, the input current is usually in micro-amps, and is independent of whether there is no load or full load. This is usually caused by the leakage current of the input circuit.
<b>Operating Temperature Range</b>	Range of ambient or case temperatures where power supplies is specified to operate safely and perform to spec
<b>Output Filter</b>	One or more discrete components used to attenuate output ripple & noise
<b>Overcurrent Protection</b>	Feature that interrupts a current to the load when a specified max current is reached
<b>Overload protection</b>	Feature that senses and responds to a current or power overload condition
<b>Overvoltage protection</b>	Feature that senses and responds to a voltage exceeding a certain limit
<b>Over temperature protection</b>	Feature that senses and responds to temperature exceeding safety zone
<b>P</b>	
<b>Peak</b>	Mximum value of a waveform reached during a particular cycle or operating time
<b>Pin out</b>	The pin assignment of a device
<b>Potentiometer</b>	Adjustable Resistor
<b>Potting</b>	Insulating material for encapsulating circuit elements
<b>Power</b>	Rate of using energy measure in watts(W). 1W=1Joule/second
<b>Power density</b>	Ratio of power available from a power source to its size
<b>Power Factor</b>	Ratio of total active power to total apparent power in Volt Amperes in an AC circuit. The voltage and current are RMS values that include effets of harmonics and phase displacement.

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<b>Power Factor Correction (PFC)</b>	Technique of changing the power factor so that the power factor approaches unity
<b>PSU</b>	Power Supply Unit
<b>Pulse width modulation(PWM)</b>	Method of regulating the output of a switch mode power supply by varying the duration of the duty cycle(not the frequency) of the pulses
<b>Q</b>	
<b>Quiescent</b>	Inactive
<b>Quiescent Current</b>	This is the standing current that flows in a circuit when the signal is not applied (no load). The quiescent current is usually very low or lower than when processing a signal. This is also known as <u>idle current</u> .
<b>R</b>	
<b>Rated Output Current</b>	Max load current on a power supply
<b>Ripple</b>	Alternation current component in the output of a power supply arising from sources within the power supply
<b>Rise time</b>	Time required for a pulse to rise from 10% to 90% of its maximum amplitude
<b>RoHS</b>	Reduction of Hazardous Substances, refers to government program to eliminate use of substances deemed to be hazardous
<b>S</b>	
<b>Safe Operating Area</b>	Manufacturer specified zone of operation that must be respected to prevent damage to power semiconductors
<b>Safety Compliance</b>	Certification Listing, licensing, recognition or approval by safety agencies.
<b>Sense Line</b>	Conductor which routes output voltage to the control loop
<b>Short Circuit</b>	Initial value of the current obtained from a power source in a circuit of negligible resistance.
<b>SMD</b>	Surface Mounted Device which is a family of components intended to be mounted directly on the surface of a circuit board
<b>SMPS</b>	Switched Mode Power Supply
<b>Soft Start</b>	Controlled turn-on to limit inrush current and control the rate of rise of output voltage.
<b>Surge</b>	Abnormally high transient voltage, current, or power.
<b>Switching Frequency</b>	Rate at which the input dc voltage is switched in a power supply.
<b>T</b>	
<b>Temperature Coefficient</b>	The average percent change in output voltage per degree change in ambient temperature over a specified range of temperatures
<b>Transient Response</b>	Time required for the output voltage to return within the regulation envelope following a 50% load change. A power supply with quick transient response will reduce the risk of read/write errors.
<b>Turn On Time</b>	The time from the application of input power until the output voltage is in regulation and meets the spec
<b>U</b>	
<b>UL</b>	Underwriter's Laboratory which is an independent organization that writes specs for and provides testing services with regards to product safety
<b>Undervoltage Protection</b>	Circuit that inhibits the power supply when the output voltage is below a specified minimum
<b>V</b>	
<b>Voltage Regulation</b>	The process of holding voltage constant between selected parameters

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W	
<b>WEEE</b>	Waste Electrical and Electronic Equipment Directive. The directive imposes the responsibility for the disposal of waste electrical and electronic equipment on the manufacturers of such equipment. Those companies should establish an infrastructure for collecting WEEE, in such a way that "Users of electrical and electronic equipment from private households should have the possibility of returning WEEE at least free of charge". Also, the companies are compelled to use the collected waste in an ecologically-friendly manner, either by ecological disposal or by reuse/refurbishment of the collected WEEE.
Z	
<b>ZCS</b>	Zero-current switching
<b>ZVS</b>	Zero-voltage switching