



GLOSSARY OF TERMS

Absolute Maximum

The maximum condition which the power converter can withstand without permanently damaging the device. Usually applied to input voltage, output current/power, or case temperature.

Aging

The long term change in output voltage of a power supply over time with all other factors held constant, usually accelerated by temperature. Long term aging is most often expressed as a percentage per 1000 hours and short term aging as a percentage over the first 24 hours of operation.

Ambient Temperature

The temperature in the medium around a component and is measured some distance from the device (usually 0.5 inches) to be considered uniform.

Balun

An inductor used for impedance matching between a BALanced line and an UNbalanced line. It presents a high impedance to common mode signals and a low impedance to differential mode signals. A balun is sometimes used in series with the input line of switching power converters to suppress common mode noise currents.

Boost Converter - Topology

The boost circuit is a commonly used building block in converter design. The switch controls energy transfer from the input source, through the inductor, to the load. The output-to-input voltage ratio, is always greater than one and is ideally equal to the inverse of one minus the duty conduction cycle of the switch during continuous operation. The boost topology also requires an output energy storage capacitor to support the load current while the switch is on.

Buck Converter - Topology

The buck circuit is another commonly used building block in converter designs. In its basic form, without a transformer, the output voltage is always less than the input voltage. When the transistor is switched on, energy is transferred from the input source to the inductor and the output. When the switch is turned off, the inductor current ramps downward and the energy is transferred to the output capacitor and the load. The output-to-input voltage ratio is ideally equal to the conduction duty cycle of the switch for continuous operation. Since most applications severely limit the amount of pulsating current that can be drawn from the converters input source, some form of low pass filter is generally inserted on the input side of the switch.

Case Temperature

The temperature of a converter measured at its base plate. Temperature ratings for converters are usually given for the case temperature (T_c). The case temperature for an operating converter is ordinarily higher than the ambient temperature.

Common

The common input or output terminal of a power supply. It carries the return current for the terminals. Also referred to as "return".

Common Mode Noise

The component of noise which is common to both the DC input and input return or output and output return with respect to a common reference. The common reference is generally the converters metal base.

Constant Voltage Power Supply

A power supply that regulates its output voltage within specified limits in spite of line, load, and temperature changes.

Cross Regulation

On multiple output power supplies, the change (usually measured in percentage) of the nominal output voltage on one output while the load is varied on another output over specified conditions.

Crowbar

An over voltage protection circuit which monitors the output voltage of a power supply and rapidly creates a low resistance path across the output when a predetermined voltage is exceeded.

Derating

A reduction in an operating specification to improve reliability.

Dielectric Breakdown Voltage

The minimum AC or DC voltage which, when applied across an isolation barrier of a power converter, can cause a direct short to the outputs or the case. Input to output and input/output to case are examples of isolation barriers. Exceeding a converters dielectric breakdown voltage can permanently degrade performance.

Differential Mode Noise

The component of noise measured from the DC output or input to the return.



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Dual Balanced Outputs

An output voltage regulation scheme for dual opposite polarity output converters in which the absolute sum of the two voltages is held constant.

Dynamic Load Regulation (Output Impedance)

The ratio of change in transient output voltage to change in load current.

Efficiency

Efficiency is measured at full load and nominal line input.
Efficiency(%) = (Output Power/Input Power) x100.

EMI (Electro magnetic Interference)

Conducted or radiated noise which is emitted from switching power supplies.

Epoxy Potting

An method of hybrid packaging which consists of coating the substrate with a conformal coating and then submerging it in a potting cup filled with epoxy. Epoxy-potted modules have excellent thermal capacity characteristics but are not as resistant to moisture or as tolerant of temperature cycles as other types of packaging.

ESR (Equivalent Series Resistance)

The amount of resistance, in series with an ideal capacitor, required to exactly model a real capacitor.

Fuse

The recommended fuse is specified for each series. External Fusing should be used for system protection. Proper fuse size will limit the input power and reduce the risk of fire should a catastrophic failure occur to either the users circuit or the power converter.

Input Current

The typical current that the converter will draw from the power source at nominal line voltage under full load and no load conditions.

Input Over Voltage

The maximum voltage allowed at the converters input terminals without damaging the converter. The specification is usually limited to 100 ms maximum duration and less than 0.05% duty cycle.

Input Range

The minimum to maximum input voltage for which the converter will meet its specifications.

Isolation

The electrical separation between input and output of a power supply by means of the power transformer. The isolation resistance (normally in meg ohms) and the isolation capacitance (normally in pico farads) are specified and are a function of materials and spacing employed throughout the power supply.

Isolation Capacitance

The measured capacitance from the input pins to the output pins.

Isolation Voltage

The maximum AC or DC voltage that may be continuously applied from input to output and/or chassis or a power supply.

Line Regulation

Is the change in output voltage when the input voltage is changed from minimum to maximum, expressed as a percentage of the output voltage.

Load Regulation

The change in output voltage when the output load is changed from minimum to maximum, expressed as a percentage of the output voltage.

Nominal Input

The nominal value listed is the voltage used for all other tests unless otherwise specified.

Operating Temperature Range (Case)

The temperature range of the environment in which the converter will operate to specified parameters with no derating. The temperature of the environment is defined as the still-air temperature in the immediate vicinity of a power supply, measured a minimum of 4 inches from the supply.

Output Trim

Output voltage trimming allows the user to change the output voltage of the module. The output trim can be either a fixed resistor or a potentiometer. Any value from zero ohm to infinity may be used to trim the output voltage when fixed resistors are used. This pin may be safely left floating if it is not used.

Over Temperature Protection

The case temperature above which the converter will shut down operation. Thermal shutdown halts the PWM operation placing the converter in a low current drain mode until the case temperature decreases.



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Over Voltage Protection

A power supply protection feature that shuts down the supply, crowbars or clamps the output when its output voltage exceeds a preset level.

Remote On/Off

Enables power supply to be remotely turned on or off. Turn-on is typically performed by open circuit or TTL logic "1" and turn-off by switch closure or TTL logic "0".

Rated Current

This is the rated load range for the output. Normally there is a minimum load required for proper operation. Operation below minimum load will not harm APDs products in any way but load regulation may suffer. Operation above the maximum rated load is not recommended as it may degrade specifications or the converters life. All APDs products are designed to be reliable in operation at the full rated load provided that the case temperature does not exceed specifications.

Reflected Ripple

Due to the switching nature of a DC/DC converter, noise is "reflected-back" into the input source. This noise is measured as a peak-to-peak current over a 0 to 20 MHz bandwidth. The largest part of this current is at the fundamental switching frequency (or twice the switching frequency for push-pull designs).

Ripple and Noise

The magnitude of AC voltage on the output of a DC/DC converter expressed in millivolts peak-to-peak or RMS at a specified band width. DC/DC converter output noise consists of two components. A frequency component at the switching frequency of the converter and a high frequency component due to the fast edges of the switching transitions. Ripple and noise should always be measured directly at the output terminals with a scope probe having an extremely short grounding lead. See Application Note: Test Configurations.

Short-Circuit Input Power

The maximum input power that a converter will source with its output shorted.

Short Circuit Protection

All of APDs converters are designed to withstand a direct short on the output pins and will recover to normal operation when the short condition is removed. Under some conditions, the long term life of the converter will be degraded unless the short is removed within a small period of time.

Storage Temperature

The range of ambient temperature in which a power supply may be safely stored, while not operating, with no degradation in its subsequent operation.

Switching Frequency

The fundamental frequency at which the DC/DC converter operates. In push-pull designs, the output ripple is actually at twice the switching frequency due to the push-pull nature of the power stage.

Transient Recovery Time

The time required for the output voltage of a power supply to settle within specified output accuracy limits following a step change in output load current or a step change in input voltage.

Transient Response Deviation

The output voltage overshoot due to the application of a step change in load. The output voltage momentarily deviates from its final regulated value.

Temperature Coefficient

The average percentage change in output voltage per degree centigrade change in ambient temperature over a specified temperature range.

Under Voltage Protection

Some power converters have an under voltage shutdown circuit that shuts the converter off in the event of a low line voltage condition. The converter is usually placed in a low power condition to prevent excessive input current from the source.

Unit Weight

The weight of the converter in grams. 1 ounce = 28.3 grams.

Voltage Balance

The voltage balance is specified on dual converters. It is the difference in absolute terms between the positive output and the negative output expressed as a percentage. For example, if the positive output is at 15.00 Volts and the negative output is at -15.15 volts the balance would be 1.0%.

Voltage Accuracy

The allowed variation in output voltage for a nominal line input and full load condition. This might also be considered the "voltage range" specification of the output voltage.