



Application Note 1

DC-DC Converter Terminology

Efficiency: The ratio of the output power to the input power during normal operation of a device.

Fault Protection: A circuit that monitors the output load and prevents output short circuits from drawing excessive current. Pulsed load protection samples the load with a low duty cycle pulse and powers up the device when the short is removed. Constant power/current protection supplies a maximum power or current to the load during the short until the short is removed. Fold back protection reduces the current to a lower level to reduce power consumption until the short is removed.

Inhibit Delay: The length of time between activation of an inhibit function and the output dropping to a predetermined value, usually 10% of its initial value.

Inhibit Recovery: The length of time between the release of an inhibit function and the output voltage reaching a predetermined value, usually 90% of its final value.

Input Current Ripple: An Alternating Current Waveform superimposed on the DC Waveform at the input of the converter. The AC waveform is a result of the switching action and is at the switching frequency of the converter.

Input Voltage Range: The maximum and minimum steady state input voltage conditions that a device can safely operate between.

Input Voltage Transient: A deviation in the input voltage that extends outside of the steady state operating min and max specifications. Usually characterized with an absolute minimum or maximum and duration. The device may be specified to either operate through the transient or merely survive the transient.

Isolation: Electrical separation between the input to output of a device. The input and output are typically electrically isolated from the package also.

Line Regulation: The amount of deviation in the output voltage when the input voltage is changed between two predetermined levels.

Line Transient Recovery: The amount of time required for the output voltage to return to within 1% of its steady state value after a step in the input voltage.

Line Transient Response: The magnitude of the overshoot or undershoot imposed on the output voltage from a step in the input voltage.

Load Regulation: The amount of deviation in the output voltage when the output load is stepped between two predetermined levels.

Load Transient Recovery: The amount of time required for the output voltage to return to within 1% of its steady state value after a step in the in the output load.

Load Transient Response: The magnitude of the overshoot or undershoot imposed on the output voltage from a step in the output load.

Output Voltage Ripple: An AC voltage waveform that is superimposed on the DC output voltage of the converter. The AC waveform is a result of the switching action and is at the switching frequency of the converter.

Output Voltage Tolerance: The range of acceptable deviation in the output voltage from nominal under nominal operating conditions, usually expressed as a percent or an absolute.

Overload: An operating level between the maximum recommended steady state output conditions and the fault protection trip point.

Power Density: The ratio of the power output of a converter to the volume of the device expressed in Watts/in³.

Remote Shutdown / Inhibit: A control designed to turn a device on or off from a single pin connection.

Soft Start: A controlled startup to reduce inrush current and output overshoot.

Start Up Delay: The length of time between a step application of an input voltage (typically from zero to nominal) and the output voltage reaching a predetermined value, usually 90% of its final value.

Start Up Overshoot: The amount that the output overshoots its final value before settling during initial startup of the device. Startup may be defined as a step application of power or by release of an inhibit function.

Synchronization: The capability to force device switching to occur at the same frequency. Can be used to reduce system noise.

TA Ambient Temperature: The temperature of the medium (air) surrounding a device.

TC Case Temperature: The temperature of the worst-case point on the case of a device (typically the bottom of the package).

TJ Junction Temperature: The temperature of the semiconductor junction inside a device.

UVLO (Under Voltage Lockout): An input voltage level that either forces the converter to turn on (voltage rising) or off (voltage falling) to ensure that the device only operates when there is enough voltage present at the input for proper regulation and/or safe operation.