List of applications that employ an active DC Load for electronics testing.

1. Power supply tests

* Steady-state load regulation. This is a measurement of how a supply reacts to a constant load. Load Regulation = (Vnl – Vfl)/ Vfl X 100 and is represented as %. Vfl, or Full Load Voltage, need not be unchanging, but the voltage is measured at specified current(s) where the load current is changed from zero to the maximum rated supply current. The rate of change for load current is low and is not intended to introduce abnormal power supply transient response. A power supply with good load regulation is able to provide an output voltage that does not change much with varying load current. The smaller the load regulation, the power supply is judged to be more stable and reliable. Typical well-regulated power supplies have load regulations of less than 1%, meaning that the output voltage will change by a maximum of 1% over the supply’s load current range. A well-regulated power ensures that the connected circuits operate correctly. Most switched mode power supplies have better regulation than linear power supplies.
* Transient response, also called Transient Load Response, to characterize the ability of the power supply to stabilize itself upon a step change in the load current. In order to verify the response, measurements of the rise and fall times upon a step change in the load is necessary. Generally, this type of test requires a load that is able to produce a rise and fall time approximately five times faster than the power supply.
* Current Limiting. Power supplies in constant voltage mode generally have a preset limit to the maximum current output. Current limit testing consists of measurements that show the behavior of a power supply and its current regulation. These measurements can be characterized by a voltage vs. current curve, which portrays how and when the power supply transitions from CV to CC mode.

1. Battery Testing.

* Battery Discharge Curves. When designing and testing batteries for powering a device, we should evaluate energy efficiency and lifetime. For this reason, a standard performance test consists of analyzing discharge curves that characterize the behavior of the battery. By observing these curves, the battery life can be measured, and its efficiency can be evaluated.
* A DC load can be an effective tool for measuring the internal resistance of a battery.

1. Solar Panel Testing.

A designer may need to determine the efficiency of a solar panel system. When connected to an inverter or battery charging system the goal is to convert maximum power from the PV panels. Maximum PV panel power depends on the panels themselves as well as environmental factors of temperature and solar irradiation.

We measure the maximum power from PV panels so that, despite environmental effects, they operate at their maximum power point (MPP).