

Battery Testing & Internal Resistance

Batteries are considered one of the most compact and reliable energy sources while on the go. There's no need to carry around fuel, and they can often reduce the overall size of products that require power while storing energy in an extremely convenient way. The importance of batteries is ever growing as our society rapidly graduates towards increasingly portable technology. Batteries are an integral part of household electronics, the medical environment, automobile design and even the military.

It is extremely important for both battery manufacturers as well as manufactures with products that utilize batteries that batteries be long-lasting, durable and efficient. This is why billions of dollars are spent every year on battery testing to make sure that batteries can continue to produce energy efficiently even when exposed to a wide variety of conditions and environments. These tests can include environmental testing, lithium ion safety testing, electrical charge safety testing and electromagnetic compatibility testing.

Challenge

As batteries age, their capacity is diminished by an increased internal resistance as well as elevated self-discharge. This rise in internal resistance inhibits power delivery and is what causes old batteries to have such a short runtime, even when fully charged. High resistance causes the battery to heat up and the voltage to drop, causing the equipment to cut off and leave energy behind. It is extremely important that test engineers ensure that their DUTs using batteries continue to operate efficiently even when the internal resistance of their power source (battery) has increased. The only way to truly test a DUT's compatibility with a battery over time is to either keep it running for its full calendar life time or perform a series of accelerated aging tests that provide a simulation of the batteries performance over the various stages of its lifetime. These tests can take very long periods of time to conduct and tend to be extremely costly, as batteries must be charged, discharged, and replaced multiple times over the test cycle period.



Figure 1. PWR-01 Internal Resistance Function

Solution

The PWR-01 programmable DC power supply comes with an all-new variable internal resistance feature that is extremely convenient for engineers looking to test their DUT's compatibility with batteries throughout their lifecycle. Test engineers in the automotive, solar panel and even fuel cell industries can easily use the PWR-01 to simulate the output of a battery at any stage of its lifecycle with the press of a button. This allows the operator to make advanced, accurate battery simulations with a single power supply, and eliminates the need to constantly charge/discharge the battery being used throughout the test cycle. The PWR-01 can save countless hours in the testing laboratory and greatly increase the efficiency of all bench-top battery-related tests.