

VINATech VPC 3.8 volt, Hybrid Capacitors, with ultra- low Leakage Current.

Features of VPC Series

- - Low Self Discharge
- - Wide Operating Temperature Range
- - High Operating Voltage
- - High Capacitance
- - Supplied Fully Charged

Lithium Ion Capacitors are hybrid capacitors, featuring the best characteristics of both EDLC and Lithium Ion Batteries. They use a carbon-based material as the negative electrode that can be doped with lithium. Just as in a conventional EDLC, they use activated carbon for the positive electrode.

Characteristics	Li-Ion Battery	VPC Lithium Hybrid Capacitor
Cell Voltage Range	2.8V – 4.2V	2.5V – 3.8V
Operating Life	2 – 5 years	>10 years
Energy Density (Wh/l)	250 – 693	10 – 90
Operating Temperature	-15 - +45C	-25 - +85C
Self-Discharge	2-3% /month	2-3% /month
Charging	Slow – hours	Fast – minutes
Failure Mode	Unpredictable Rapid drop in voltage	Predictable Drop in capacitance
Safety	Environmental Hazard	Eco Friendly
Mandatory Recycling	Yes	No

EDLCs are typically used to protect against sudden momentary drops or sudden interruptions in power. They can instantaneously output large amounts of power, while a battery cannot. They are frequently used as backup power sources in servers and storage devices for integrated circuits, processors, memory etc. While EDLCs are intended to be backup power sources, conventional EDLCs suffer from a phenomenon known as self-discharge, where the capacitor will gradually lose its charge over time. Self-discharge can occur more rapidly during exposure to high temperature environments.

The extremely low self-discharge of the Hybrid Capacitor, even in high heat environments, ensures a long-lasting charge.

As with all Lithium Ion devices, it is imperative that the charge Voltage is not drained below 2.5V. A simple N-Channel MOSFET can be used for this purpose to de-active the load and protect the Lithium Ion device.

Lithium Ion Capacitors are increasingly relied on as supplementary power sources in manufacturing and medical equipment, where even momentary drops in voltage can be critical. They serve to compensate for uneven voltage levels with solar panels and even as primary power sources in small devices. Most significantly, Lithium Ion Capacitors are becoming a preferred backup solution for power interruption in servers and other devices.

Since the self-discharge is so low, a simple trickle charge circuit can be employed to top-up the charge over time. The MSI MSRFIF is an ideal solution for this application as attached; the MSRFIF can be powered by ambient RF signals or vibrations from a Piezo device. The MSRFIF generates a trickle charge voltage to charge the VPC.

The VPC Series is ideal to supply power to IOT devices or alarm systems where immediate reliable power is required.

