



## Notes and Precautions

The hybrid-supercapacitor product line, or PowerRESPONDER®, are high energy, high power storage devices, that if used properly will provide datasheet performance and reliable service for the life of the product. These devices are UL™ listed (UL BBBG2.MH61110) and are generally robust regarding handling and application.

### ***Voltage and electrical current precautions:***

The maximum voltage value identified in the data sheet (Voltage Range Max) is set to derive the specified product performance. Exceeding this value for extended periods of time could result in shorter Cycle Life and ultimately may lead to device failure. Operation below this maximum has been shown to extend product life.

The minimum voltage value identified in the data sheet (Voltage Range Min) is set to derive the specified product performance. Discharging the device below this value for extended periods of time could result in shorter product Life and ultimately may lead to device failure.

The maximum current value identified in the data sheet (Charge/Discharge Tolerance) is set to derive the specified product performance. Exceeding this value for extended periods of time could result in shorter Cycle Life and ultimately may lead to device failure. Operation below the Nominal Charge/Discharge current has been shown to extend product life.

### ***Temperature precaution:***

Performance specifications are representative of the device characteristics at 25°C. Use or storage at temperatures above the Operating Max or Storing Max may result in permanent loss of capacity over time. Temperatures from 25°C down to Operating Min may result in temporarily lower Capacitance and higher max initial DC/AC ESR values.

### ***Terminal precaution:***

PowerRESPONDER® terminals are designated by polarity “+” and “-”. “+” is the high-potential input and precautions should be observed to insure that the terminals are not reversed or shorted. The TAB construction is fragile and therefore multiple bends should be avoided.

### ***Physical package precaution:***

PowerRESPONDER® sleeve packaging material is not guaranteed to be non-conductive. Use caution to insure that contact points to the exterior neither deform nor penetrate the device. Though the devices are flexible in handling, creases in edge seal may result in rupture and loss of electrolyte resulting in premature failure. Tangential force to the surface of the device of 15psi or greater should be avoided. The maximum expansion of the thickness dimension over the life of the product could be as great as 25%.

### ***Series Parallel Connection precaution:***



## Notes and Precautions

PowerRESPONDER® devices may be connected in series and/or parallel to achieve the desired operational voltage and storage requirements of the application. Assembly techniques need insure that the difference in terminal voltage of individual cells intended for parallel combination not exceed a difference of 500mV to avoid excessive current transfer during connection. Devices, or parallel combinations of devices, will require balancing during operation in order to insure maximum performance.

### ***Assembly precaution:***

The PowerRESPONDER® Hybrid-Supercapacitor is shipped in a charged state. DO NOT DISCHARGE BELOW Voltage Range Min TO ASSEMBLE. A commonly available Li-Ion protection device may be employed in the circuit in order to electrically isolate the device from the end product.

### ***Soldering precaution:***

The PowerRESPONDER® solderable TAB is not suitable for solder bath or solder reflow assembly. Devices are hand soldered to the following specification: The recommended temperature of the soldering rod tip is less than or equal to 350°C. The soldering duration should be shorter than 3 seconds. Minimize the time that the soldering iron is in direct contact with the terminals of the device as excessive heating of the leads may lead to seal compromise. Recommended solder Composition - Sn96.5% Ag3.0% Cu0.5% alloy (Kester SN96227558). If not using flux core wire, use a halide free, activated rosin based flux if required. Maximum contact time with component leads is 10 seconds. Specification sheets and SDS on lead-free solder materials used by a customer are available on request.

### ***Shipping procedures:***

PowerRESPONDER cells may be shipped as a normal consignment with no restrictions. As per IATA guidelines, the PowerRESPONDER cells are classified as "UN 3508 Capacitor, asymmetric" and under IATA special provision A196 and 49CFR 173.176 the typical labeling and shipping requirements are waived.

### ***Product disposal precaution:***

Though non-toxic and ROHS compliant you should comply with local regulations when disposing of PowerRESPONDER® devices.

*For more information please contact PRC Tech at [info@powerresponder.co](mailto:info@powerresponder.co)*