



## Series: Snap-In Hybrid

### Features:

- Board mountable
- Solderable
- UL Recognized
- RoHS compliant

### Applications:

- Low power, low energy
- Low rate cycling
- Rapid charge slow discharge

### Markets:

- Solar lighting
- Low power backup
- Medical devices
- LED lighting
- Handheld devices

### Markings:

**Products are marked with the following:**

Rated capacitance, rated voltage, product number, name of manufacturer, negative terminal marking.



#### Operating

|                       |               |
|-----------------------|---------------|
| Voltage, Rated        | 1.0 V – 2.3 V |
| Voltage, Surge        | 2.5 V         |
| Capacitance Tolerance | +10% / -5%    |

#### Temperature

|                    |               |
|--------------------|---------------|
| Range, Operational | -40°C to 60°C |
| Range, Storage     | -40°C to 65°C |

#### Life

|           |                                                   |
|-----------|---------------------------------------------------|
| DC        | 10 years, rated voltage, 25°C                     |
|           | $\Delta C < 20\%$ decrease, ESR < 100% increase   |
| Endurance | >1000 hrs, rated voltage, 50°C                    |
|           | $\Delta C < 30\%$ decrease, ESR < 100% increase   |
| Shelf     | 1000 hrs, no voltage, 65°C                        |
|           | $\Delta C < 20\%$ decrease, ESR < 100% increase   |
| Cycle     | >10,000 cycles, Rated to half rated voltage, 25°C |
|           | $\Delta C, 20\%$ decrease, ESR, 100% increase     |

#### Standards Compliance

UL 810a RoHS BS EN 60068-2-6,27,29  
IEC 60068-2-14 SAE J2464, J2390, J1455 IP65  
MIL 810 B-(516.3-5, 514.3-1, 509.2-1) ASTM B117



## Product Specifications

| Part Number | RHE2R3227SR | RHE2R3307SR | RHE2R3807SR | RHE2R3827SR | RHE2R3108SR |
|-------------|-------------|-------------|-------------|-------------|-------------|
|-------------|-------------|-------------|-------------|-------------|-------------|

### Electrical

|                                     |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|
| Capacitance (F)                     | 220  | 300  | 800  | 820  | 1000 |
| ESR, DC $\leq$ (m $\Omega$ ) [10ms] | 40.0 | 25.0 | 15.0 | 12.0 | 14.0 |
| ESR, AC 1kHz $\leq$ (m $\Omega$ )   | 25.0 | 15.0 | 8.0  | 6.0  | 7.0  |
| Inductance $\pm$ 30(nH)             | <100 | <100 | <100 | <100 | <100 |
| 72hr Leakage $\leq$ (mA)            | 0.20 | 0.55 | 0.50 | 0.50 | 0.70 |

### Cycling

|                            |    |     |     |     |     |
|----------------------------|----|-----|-----|-----|-----|
| Current, Peak [1s] (A)     | 26 | 41  | 71  | 87  | 77  |
| Continuous Current (A)*    | 5  | 5.5 | 7   | 7.5 | 8   |
| Current, Short Circuit (A) | 92 | 153 | 288 | 383 | 329 |

### Thermal

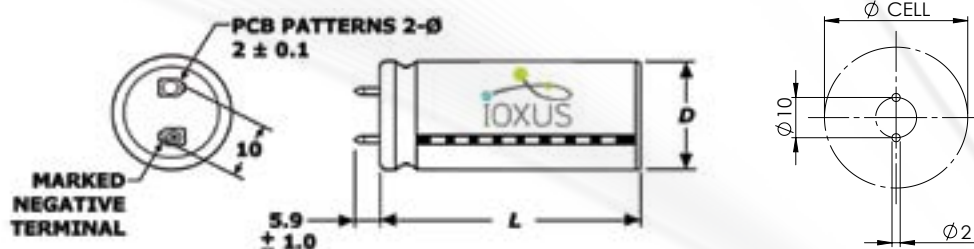
|                                       |    |    |    |   |   |
|---------------------------------------|----|----|----|---|---|
| Resistance, Thermal ( $^{\circ}$ C/W) | 22 | 11 | 10 | 8 | 8 |
|---------------------------------------|----|----|----|---|---|

### Energy/Power

|                     |      |      |      |      |      |
|---------------------|------|------|------|------|------|
| $E_{\max}$ (Whr)    | 0.13 | 0.18 | 0.48 | 0.49 | 0.60 |
| $E_{\max}$ (Whr/kg) | 5.2  | 6.6  | 5.2  | 7.0  | 5.2  |
| $E_{\max}$ (Whr/L)  | 7.7  | 10.4 | 7.3  | 10.7 | 7.0  |
| $P_{\max}$ (kW/kg)  | 2.1  | 3.3  | 1.8  | 3.1  | 2.1  |
| $P_{\max}$ (kW/L)   | 3.1  | 5.2  | 2.5  | 4.8  | 2.2  |
| $P_d$ (kW/kg)       | 0.63 | 0.94 | 0.47 | 0.76 | 0.50 |

### Physical

|              |       |       |       |       |       |
|--------------|-------|-------|-------|-------|-------|
| D (mm) +1/-0 | 22    | 22    | 35    | 27    | 35    |
| L (mm) +/-2  | 45    | 45    | 68    | 80    | 88    |
| Mass (kg)    | 0.025 | 0.027 | 0.091 | 0.070 | 0.115 |
| Volume (L)   | 0.017 | 0.017 | 0.065 | 0.046 | 0.085 |



### Additional Technical Information

Product specification test methods available in separate document.

\*Rated current = continuous current with 20 $^{\circ}$ C temperature rise.

### Mounting Recommendation

Do not reverse polarize. Solder following recommendations in *Notes on Using Ultracapacitors*, available at [www.ioxus.com](http://www.ioxus.com).



18 Stadium Circle, Oneonta, NY 13820, USA

Toll Free: +1.877.751.4222

607.441.3500 | Fax: 607.433.9014

[www.ioxus.com](http://www.ioxus.com) | [info@ioxus.com](mailto:info@ioxus.com)

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