Hybrid Layer Capacitor (HLC)  
For PulesesPlus™ batteries

**Electrical characteristics** (For batteries stored at RT for 1 year or less)
- Capacity when charge to 3.67 V: 250 As
- Capacity when charge to 3.90 V: 380 As
- Discharge end voltage: 2.5 V (discharge below 2.5 V at RT may increase the HLC internal impedance). For other temperatures and discharge condition please contact Tadiran for these end voltage conditions.

**Mechanical characteristics**
- Length: 27.4 mm. max
- Diameter: 15.1 mm. max
- Weight: 9.9 gr. max

**Operating conditions**
- Maximum discharge current:
  - Continuous: 0.75 A
  - Pulse, 1 sec: 3.0 A
- Charge (constant current)
  - Max. charge voltage: 3.95 V
  - Max. charge current: 50 mA
- Operating temperature range
  - HLC in PulesesPlus™ battery: -40 °C ÷ +85 °C
  - Storage temperature range of HLC: -40 °C ÷ +60 °C
- Cell impedance at RT: < 140 mΩ at 1 kHz
- Self discharge of PulesesPlus™ battery at RT: 1.8 μA
- Self discharge of PulesesPlus™ battery at 80 °C: 8 μA

**Shelf life at different storage temperature to 80% of initial capacity**

<table>
<thead>
<tr>
<th>Temperature</th>
<th>HLC in PulesesPlus™ battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT</td>
<td>3 years</td>
</tr>
<tr>
<td>60 °C</td>
<td>4 weeks</td>
</tr>
<tr>
<td>80 °C</td>
<td>1 week</td>
</tr>
</tbody>
</table>

**Safety**

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short circuit at RT and at +55 °C</td>
<td>UL, UN, IEC</td>
</tr>
<tr>
<td>Oven at +150 °C</td>
<td>UL, IEC</td>
</tr>
<tr>
<td>Over-charge &amp; over-discharge (200 % at currents up to 1 A)</td>
<td>UL, UN, IEC</td>
</tr>
<tr>
<td>Impact</td>
<td>UL, UN, IEC</td>
</tr>
<tr>
<td>Compression</td>
<td>UL, IEC</td>
</tr>
<tr>
<td>Shock and vibration</td>
<td>UL, IEC</td>
</tr>
</tbody>
</table>

UN Manual of Tests and Criteria, UL 1642, IEC 60086

**Technology**
- Anode: Carbon based
- Cathode: Multi metal oxides
- Electrolyte: Organic
- Shut down separator

**Key Features**
- Hermetically sealed (glass-to-metal)
- Wide operating temperature range
- Low self discharge
- End of life indication capability
- High reliability
- Lightweight
- Safe design

**Main Applications**
- Utility Meters (AMR)
- Asset, Container & Cargo Tracking
- RFID Devices
- Sonar Buoys
- Communication Equipment
- Emergency & Medical Devices

**Ordering Part No.**
- HLC -1530A/S 61153122000
- HLC -1530A/T 61153122150
- HLC -1530A/TP 61153132000
- HLC -1530A/PT2 61153135000

**UL Approved under file MH12193 issued December 7th, 2000**

**WARNING:**
- Fire, Explosion, And Severe Burn Hazard.
- Do Not Recharge, Crush, Disassemble, Heat Above 100°C, Incinerate Or Short Circuit.

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Performance data

Voltage curves for HLC1530A at Li/\text{SOCl}_2\text{ potential (3.67 V)}, 350 mA

[Graph showing voltage curves for HLC1530A at Li/\text{SOCl}_2\text{ potential (3.67 V)}, 350 mA]

Voltage curves for HLC1530A at Li/\text{SOCl}_2\text{ potential (3.90 V)}, 350 mA

[Graph showing voltage curves for HLC1530A at Li/\text{SOCl}_2\text{ potential (3.90 V)}, 350 mA]

Voltage curves for HLC1530A at Li/\text{SOCl}_2\text{ potential (3.67 V)}, 600 mA

[Graph showing voltage curves for HLC1530A at Li/\text{SOCl}_2\text{ potential (3.67 V)}, 600 mA]

Voltage curves for HLC1530A at Li/\text{SOCl}_2\text{ potential (3.90 V)}, 600 mA

[Graph showing voltage curves for HLC1530A at Li/\text{SOCl}_2\text{ potential (3.90 V)}, 600 mA]

Available capacity vs. OCV for HLC1530A (at RT, 90 mA discharge)

[Graph showing available capacity vs. OCV for HLC1530A (at RT, 90 mA discharge)]

Warning:

- The HLC is designed for use in a PulsesPlus™ battery or in low charge current as specified only. The HLC may explode or violently vent if over-charge above 4.4V.
- Do not charge the HLC higher than 4.1 V, over discharge, short circuit, heat above 100 °C, incinerate or expose content to water.
- Charging the HLC at above 3.95 V may lead to capacity loss and / or internal impedance rise.
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Lead terminations

HLC-1530A/T (Soldering Tabs)
Cat. # 61153122150

HLC-1530A/S (Standard)
Cat. # 61153122000

HLC-1530A/TP (PCB Mountable - Polarized)
Cat. # 61153132000

HLC-1530A/PT2 (PCB Mountable)
Cat. # 61153135000