Hybrid Layer Capacitor (HLC)  
For PulsesPlus™ batteries

Electrical characteristics (For batteries stored at RT for 1 year or less)
- Capacity when charged to 3.67 V: 50 As
- Capacity when charged to 3.90 V: 75 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: 21 - 1 mm.
- Diameter: 10.0 +0.5/-0.0 mm.
- Weight: 4.2 gr. max

Operating conditions
- Maximum discharge current:
  - Continuous: 250 mA
  - Pulse: 2000 mA
- Charge (for HLC testing purpose only):
  - Max. charge voltage: 3.95 V
  - Max. charge current: 8 mA
- Operating & Storage temperature range
  - HLC in PulsesPlus™ battery: -40 °C ÷ +85 °C
  - Storage temperature range for HLC: -40 °C ÷ +60 °C
  - Cell impedance at RT: < 200 mΩ at 1 kHz
- Self discharge in PulsesPlus™ battery at RT: 1 µA
- Self discharge in PulsesPlus™ battery at 80 °C: 5 µA

<table>
<thead>
<tr>
<th>Temperature</th>
<th>HLC</th>
<th>HLC in PulsesPlus™ battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT</td>
<td>1 year</td>
<td>&gt;10 years</td>
</tr>
<tr>
<td>60 °C</td>
<td>2 weeks</td>
<td>10 years</td>
</tr>
<tr>
<td>80 °C</td>
<td>1 week</td>
<td>2 years</td>
</tr>
</tbody>
</table>

Safety Tested according to:
- Short circuit at RT and at +55 °C: UL, UN, IEC
- Oven at +150 °C: UL, IEC
- Over-charge & over-discharge (200 % at currents up to 80 mA): UL, UN, IEC
- Impact: UL, UN, IEC
- Compression: UL, IEC
- Shock and Vibration: UL, IEC

UN Manual of Tests and Criteria, UL 1642 (pending), IEC 60086 (pending)

Technology
- Anode: Carbon based
- Cathode: Multi metal oxides
- Electrolyte: Organic

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

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

Ordering Part No.
- HLC-1020 P6/S: 61102622000
- HLC-1020 P6/T: 61102622150

Tadiran Batteries Ltd.
34 Yitzhak Rabin Boulevard
Kiryat Ekron 76950, Israel
Tel: +972 (8) 944-4555
Fax: +972 (8) 941-3079
www.tadiranbatteries.com

WARNING:

THE INFORMATION PROVIDED HERE IS NECESSARILY OF A GENERAL NATURE. SINCE SPECIFIC PERFORMANCE DEPENDS ON ACTUAL OPERATING AND STORAGE CONDITIONS, OUR ENGINEERS WILL PROVIDE PARTICULAR APPLICATION INSTRUCTIONS UPON REQUEST. DATA SUBJECT TO REVISION WITHOUT NOTICE. ANY REPRESENTATION IN THIS BROCHURE CONCERNING PERFORMANCE ARE FOR INFORMATION PURPOSES ONLY AND NOT WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF FUTURE PERFORMANCE. TADIRAN'S STANDARD LIMITED WARRANTY, STATED IN ITS SALES CONTRACT OR ORDER CONFIRMATION FORM IS THE ONLY WARRANTY OFFERED BY TADIRAN.

Rev A, February 2019
Performance data

Voltage curves for HLC1020 P6 at Li/\text{SOCl}_2\text{ potential (3.67 V), 200 mA}

Voltage curves for HLC1020 P6 at Li/\text{SOCl}_2\text{ potential (3.67 V), 500 mA}

Voltage curves, @ RT, for HLC1020 P6 at Li/\text{SOCl}_2\text{ potential (3.67 V)}

Voltage curves for HLC1020 P6 at Li/\text{SO}_2\text{Cl}_2\text{ potential (3.90 V), 200 mA}

Voltage curves for HLC1020 P6 at Li/\text{SO}_2\text{Cl}_2\text{ potential (3.90 V), 500 mA}

Voltage curves, @ RT, for HLC1020 P6 at Li/\text{SO}_2\text{Cl}_2\text{ potential (3.90 V)}
Discharge capacity vs. OCV for HLC1020 P6 (at RT, 1 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.
- Charging the HLC at above 3.95 V may lead to capacity loss and/or internal impedance rise.
- Do not charge the HLC higher than 4.1 V, over discharge, short circuit, heat above 100°C, incinerate or expose content to water.
Lead terminations

HLC-1020 P6/S (Standard Contacts)
Cat. # 61102622000

HLC-1020 P6/T (Soldering Tabs)
Cat. # 61102622150