

# HLC-1020



## 1/2AAA Size Hybrid Layer Capacitor (HLC)



**Notice: Use as part of PulsesPlus™ battery only.**  
 Consult with Tadiran to confirm applicability for specific application requirements.

### Physical Characteristics

Length	21.5 mm. max.
Diameter	10.5 mm. max.
Weight	4.2 g. max.

### Electrical Characteristics (for batteries stored at RT for 1 year or less)

Capacity when charged to 3.67V	45 As
Capacity when charged to 3.90V	70 As
Maximum Discharge Current	
Continuous (without PTC)	250 mA
1 second pulse (without PTC)	750 mA
Operating temperature range	-40 to +85 °C
Storage temperature range	-55 to +85 °C
Self discharge in PulsesPlus™ battery at RT	1 µA
Self discharge in PulsesPlus™ battery at 80°C	5 µA
Impedance at RT	< 400 mΩ at 1 kHz

### Shelf life at different storage temperatures to 80% of initial capacity

Temperature	HLC when not connected to a primary cell	HLC in PulsesPlus™ battery
RT	1 year	>10 years
60°C	2 weeks	10 years
80°C	1 week	2 years

### Safety Warnings (if HLC is not connected to primary cell)

The HLC is designed for use in a PulsesPlus™ battery or in low charge current as specified only.

The open-circuit voltage during storage shall not fall below 2.8V.

Discharging below 2.5V at RT may increase the HLC's internal impedance.

The maximum charge current, when HLC is not charged by primary cell, is 8 mA.

Maximum Charging Voltage is 3.95 V. Charging the HLC at above 3.95 V may lead to capacity loss and / or internal impedance rise.

Do not charge the HLC above 4.1V. Charging above 4.4V may cause the HLC to explode or vent violently.

### Safety Compliance

The cells successfully passed the following tests:

- Altitude simulation
- Shock & Vibration
- Short Circuit at RT and 57 °C
- Heating at 130 °C
- Forced Discharge
- Crush
- Impact
- Temperature Cycling
- Overcharge



### Key Features

- Up to 25 years lifetime and more
- Hermetically sealed (glass-to-metal)
- Wide operating temperature range
- Low self discharge
- Large number of cycles
- High output current
- High reliability
- Safe design
- Lightweight

### Main Applications

- Utility Meters
- Asset, Container & Cargo Tracking
- RFID Devices
- Communication Equipment
- Internet of Things (IoT)
- Emergency and Medical devices
- Sonar Buoys

### Ordering P/N:

HLC-1020/S	61-1020-22000
HLC-1020/T	61-1020-22150
HLC-1020/TP	61-1020-29000

#### WARNING:

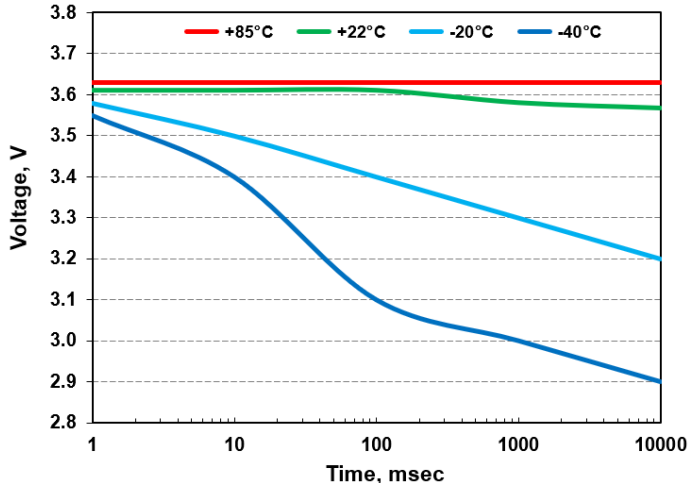
Fire, Explosion, And Severe Burn hazards.  
 Do Not Crush, Disassemble, Heat Above 100°C, Short Circuit, Incinerate Or Expose Contents to water.

[www.tadiranbatteries.com](http://www.tadiranbatteries.com)

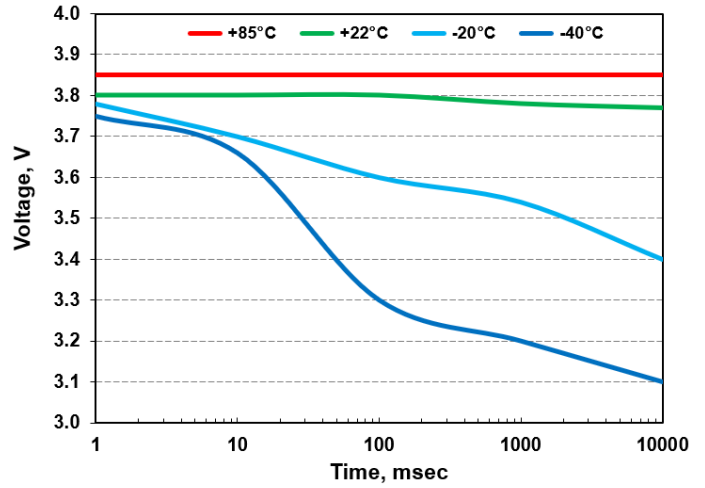
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## Performance Data

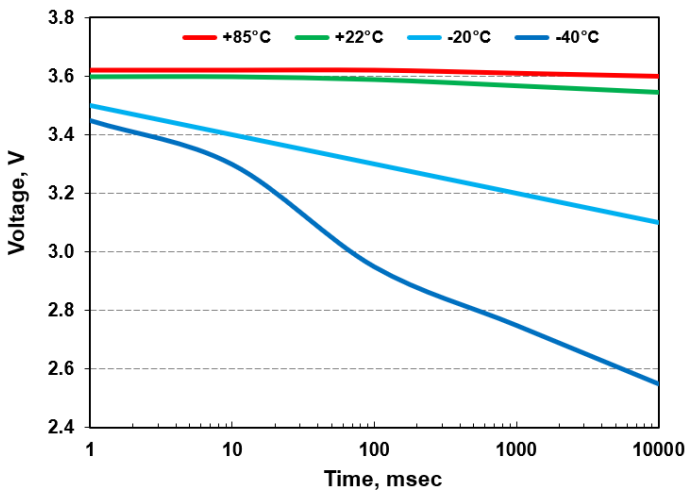
Voltage curves for HLC-1020 at Li/SOCl<sub>2</sub> potential (3.67V), 60 mA



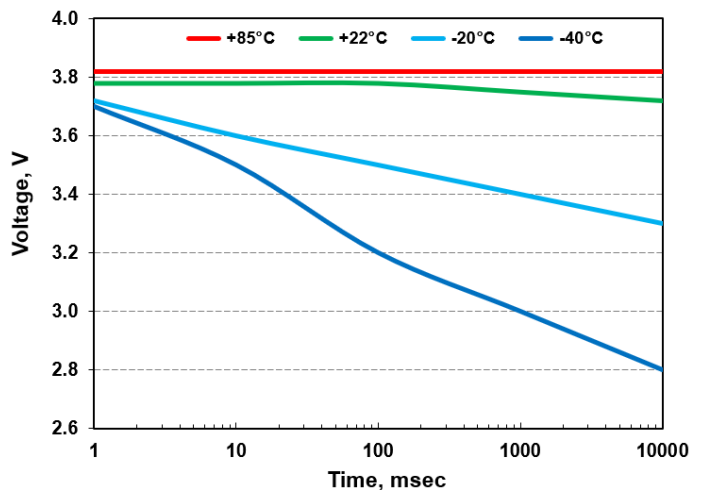
Voltage curves for HLC-1020 at Li/SO<sub>2</sub>Cl<sub>2</sub> potential (3.90V), 60 mA



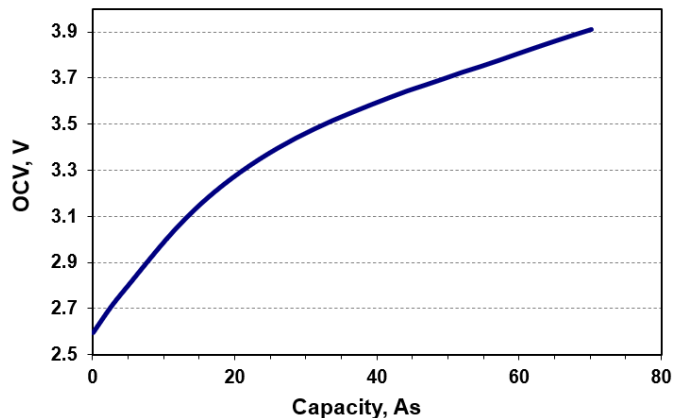
Voltage curves for HLC-1020 at Li/SOCl<sub>2</sub> potential (3.67V), 100 mA



Voltage curves for HLC-1020 at Li/SO<sub>2</sub>Cl<sub>2</sub> potential (3.90V), 100 mA



Discharge capacity vs. OCV for HLC-1020 (at RT, 15 mA discharge)



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