Lithium Ion Capacitors
TAIYO YUDEN's Lithium Ion Capacitors address critical power storage needs in the market.

Our product provides solutions to today's challenges in power storage:

- The battery charging and discharging time is limited
- Lithium Ion battery performance is inefficient
- Storage devices must be able to charge and discharge rapidly
- There is a need for a pressure-resistant electric double-layer capacitor
- There is a need for a high capacity electric double-layer capacitor

TAIYO YUDEN’s Lithium Ion Capacitor is the SOLUTION!
Energy Characteristics of Various Storage Devices

Output Density = Output Per Mass (workload)

Energy Density = Energy Stored Per Mass

- Multilayer Ceramic Capacitors
- Electrolytic Capacitors
- Polyacene Capacitors
- Electric Double-Layer Capacitors
- Lithium Ion Capacitors
- Batteries

TAIYO YUDEN’s Capacitor Product Group
Major Applications of Lithium Ion Capacitor

- Longevity
- Alternate to Batteries
- Low Resistance
- Peak Assist
- Large Current Discharge
- Back up
## Comparison

<table>
<thead>
<tr>
<th></th>
<th>Electric Double-Layer Capacitors</th>
<th>Lithium Ion Capacitors</th>
<th>Lithium Ion Rechargeable Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Temperature Range</strong></td>
<td>-40°C to +70°C (85°C)</td>
<td>-30°C to +60°C/+70°C (85°C)</td>
<td>-20°C to +60°C</td>
</tr>
<tr>
<td><strong>Maximum Rated Voltage</strong></td>
<td>2.3 to 3.0V</td>
<td>3.8V</td>
<td>4.1 to 4.3V</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>△ 1</td>
<td>○ 2</td>
<td>◎ 100</td>
</tr>
<tr>
<td></td>
<td>(100k cycle times)</td>
<td>(100k cycle times)</td>
<td></td>
</tr>
<tr>
<td><strong>Charge-Discharge Cycle</strong></td>
<td>◎ (100k cycle times)</td>
<td>◎ (100k cycle times)</td>
<td>△ (500 to 1k cycle times)</td>
</tr>
<tr>
<td><strong>Self-Discharging</strong></td>
<td>×</td>
<td>◎</td>
<td>◎</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>◎</td>
<td>◎</td>
<td>△</td>
</tr>
</tbody>
</table>
Features of Lithium Ion Capacitor

Low-Self Discharge (energy retention)

- LIC1235R3R8406

High Heat Resistance

- 3.8V 70°C
- 3.5V 85°C
Safety considerations of TAIYO YUDEN's Lithium Ion Capacitor

No Opening or Damage of the Safety Valve

No Risk of Thermal Runaway
Applications for Lithium Ion Capacitor

- Energy Harvesting
- Main Power Source
- Automobile
  - Power Assist
  - Energy Recovery
- Backup Power
  - of Storage Servers
- Smartphone, Blood Glucose Meter, Handheld Apparatus
  - RTC Backup
- Smart Meter
  - Power Backup
- Industrial Apparatus
  - Power Backup
  - Main Power Source
- Lights and Emergency Lamps
  - Power Backups