



## Product Data

### Model R15803 Li-ion D Cell

#### Electrical Characteristics

Nominal Voltage	3.70V
Rated Capacity	5.2Ah

#### Physical Characteristics

Height	2.374 ± .008 in (60.3 ±0.2mm)
Diameter	1.335 ± .004 in (33.9 ±0.1mm)
Weight (nominal)	136g

#### Operating Characteristics

Discharge Temperature Range	-40°F to +158°F (-40°C to +70°C)
Max. Continuous Discharge Current	8.0A
End (of discharge) Voltage	2.5V
Charging Method	Current limited and voltage limited
Charge Temperature Range	32°F to +122°F (0°C to +50°C)
Max. Recommended Charge Current	1.7A
End (of charge) Voltage	4.2V ±0.05V

#### Safety and Abuse Testing

*This product has undergone extensive safety and abuse testing to ensure rigorous standards of safety and security for the user.*

Continuous Charge	Short Circuit
Shock	Forced Discharge
Vibration	Overcharge
High Temperature Storage	Internal Short-circuit
Thermal Shock	High Rate Charge
Altitude Simulation	Free Fall

#### Transportation Testing

*The R15803 has been tested and meets the requirements of UN Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria, Fourth Revised Edition, Section 38.3.*

*This model is classified as Class 9, Dangerous Goods for transportation purposes per the UN Recommendations on the Transport of Dangerous Goods – Model Regulations, Thirteenth Revised Edition. This model must be packaged, labeled, and documented according to country and international regulations for transportation.*

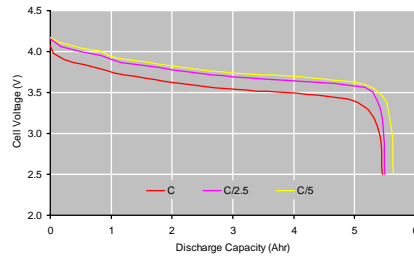
# R15803 Li-ion Cell

## Cell Performance Characteristics

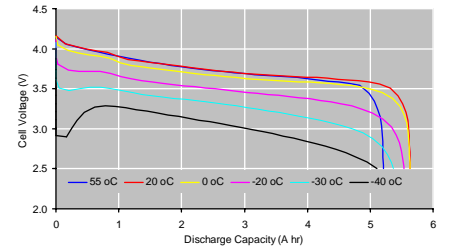
### Product Benefits:

- **High energy density**  
*up to three times that of NiCd cells*
- **High running voltage**  
*replaces three NiCd or NiMH cells*
- **Excellent low temperature performance**  
*will operate down to -40°C and below*
- **Simple charging methods**  
*combination of constant current and constant voltage*
- **No memory effects**  
*unlike NiCd cells no need for conditioning cycles after shallow discharges*
- **Proven cycle life**  
*extended cycle life throughout operational environment*
- **Environmentally Friendly**  
*contains no cadmium or lead*

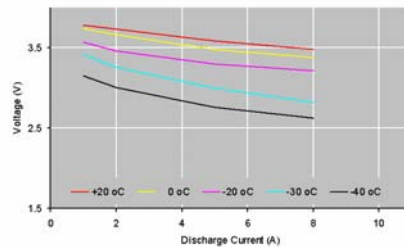
**Discharge Capacity vs Current Drain Discharge at +20°C**



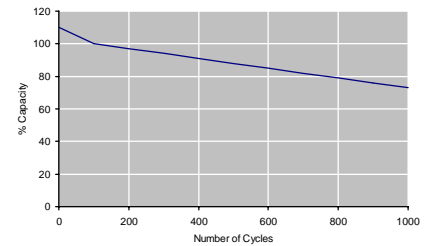
**Discharge Capacity vs Temperature Discharge at C/2.5**



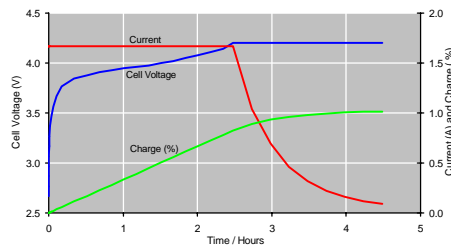
**Voltage vs Current & Temperature Avg. discharge voltage**



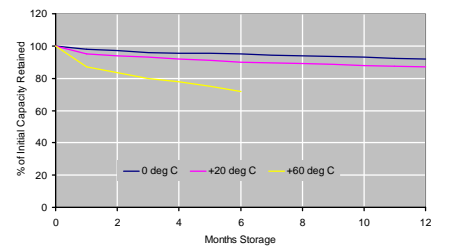
**Cycle Life\* Discharge at C/2.5 rate at +20°C charge at C/3 rate**



**Charging Method CCCV Charging**



**Charge Retention Discharge at C/2.5 rate**



\* Cycle life will vary with charge rate, discharge rate, depth of discharge and operating temperature, consult Electrochem for details.

# R15803 Li-ion Cell

## Integral Protection

### Technical Description

The R15803 Li-ion cell is fitted with a special top-cap assembly, which incorporates a small protection circuit within the confines of the standard top-cap assembly.

This protection circuit provides two safety functions:

- Overcharge protection
- Enhanced short-circuit protection

### Overcharge Protection

Voltage sensing circuitry is used to monitor for an overcharge condition on the cell. If the cell voltage increases above the detection voltage, then a protection circuit acts to prevent further charging. See Table 1 for operating parameters.

In practice, this protection circuit has two modes of operation:

1. At recommended charge currents, or greater, the action of the protection circuit will create an irreversible open-circuit in the cell, preventing further charging or discharging <sup>#1</sup>.
2. At reduced currents (less than 1.2 to 1.5A), the action of the protection circuit will be to absorb charger current and to discharge the cell to the release voltage. This is likely to create a cycling action until the charge current is removed.

### Enhanced Short-circuit Protection

A lower current, faster acting fuse with a nominal current rating of 8A has been used, see Table 1.

**Table 1: Operating Parameters**

Parameter	Specification			Unit
	Minimum	Typical	Maximum	
Overcharge detection voltage	4.354	4.450	4.571	V
Release voltage	4.329	4.400	4.471	V
Delay time	1000	1500	2000	mS
Consumption current	-	24	35	µA
Additional circuit resistance	4	8	12	mΩ
Nominal rated current (fuse)	-	8 <sup>#2,#3</sup>	-	A

<sup>#1</sup> The battery protection circuit must be designed to always operate before the in-cell protection.

<sup>#2</sup> Rated current @ specified temperatures: 9A @ 25°C, 8.5A @ 40°C, 7A @ 60°C.

<sup>#3</sup> The fuse is also rated to withstand inrush currents of up to 80A/5mS.