Rechargeable lithium-ion battery

VL 34 P - high power cell

(Optimized for 1 C to 15 C continuous discharge or up to 70 C pulse power)

Benefits

- Excellent power density and specific power
- Power capability at cold temperature
- 100 % coulombic efficiency
- Hermetically-sealed cells
- Completely maintenance free
- Operates in any orientation
- Long cycle life:
  - 80% of initial capacity after 2,000 cycles at 100% DOD
  - 500,000 cycles during shallow cycling (~3% DOD)
- Projected 15 years calendar life for hybrid electric vehicle (HEV) application
- No memory effect
- Integral safety vent

Main applications

- Military hybrid electric vehicles
- High pulse power applications
- Defense

Key features

- Graphite-based anode
- Nickel alloy oxide-based cathode
- Sold only as assembled batteries
- Incorporating electronics for performance efficiency:
  - Charge/floating/discharge management
  - Cell balancing

Cell electrical characteristics	
Nominal voltage	3.6 V
Nominal capacity at C rate at 4.1 V/2.5 V & 25° C	33 Ah
Maximum discharge current at 25° C:	
Continuous	500 + A
~2 s pulse	1900 A
~100 ms pulse	2400 A
Specific energy	120 Wh/Kg
Energy density[1]	280 Wh/l
Cell mechanical characteristics	
Diameter max	54 mm
Height max[1]	195 mm
Mass max	0.94 kg
Volume max[1]	0.41 l
Cell operating conditions	
Lower voltage limit for discharge:	
Continuous (- 20° C to + 45° C) pulse	2.5/2.0
Pulse	1.9
Charging method	Constant current/constant voltage (CCCV)
Charging voltage	4.1 ± 0.04
Recommended continuous charge current at C rate	C/2
Operating temperature:	
Charge	+ 5° C to + 35° C
Discharge	- 30° C to + 60° C
Storage and transportation temperature	- 40° C to + 65° C

[1] *Includes terminals*

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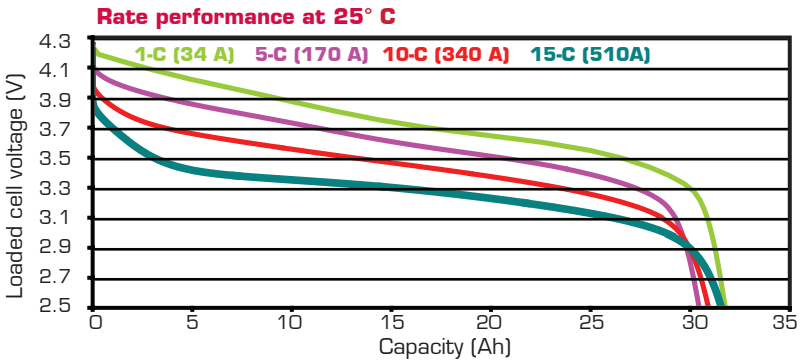
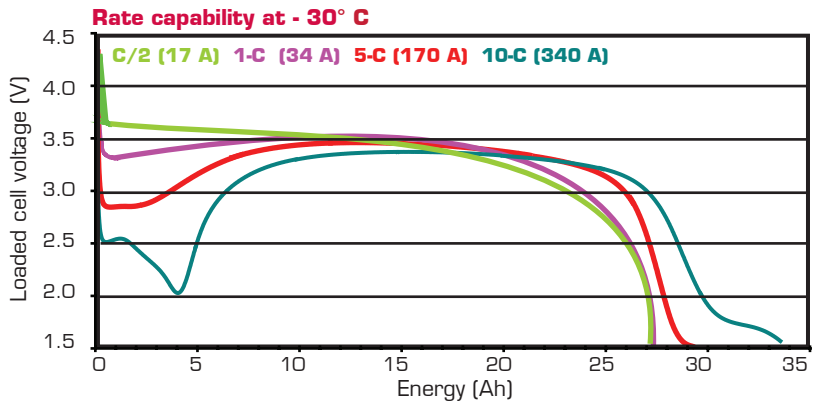
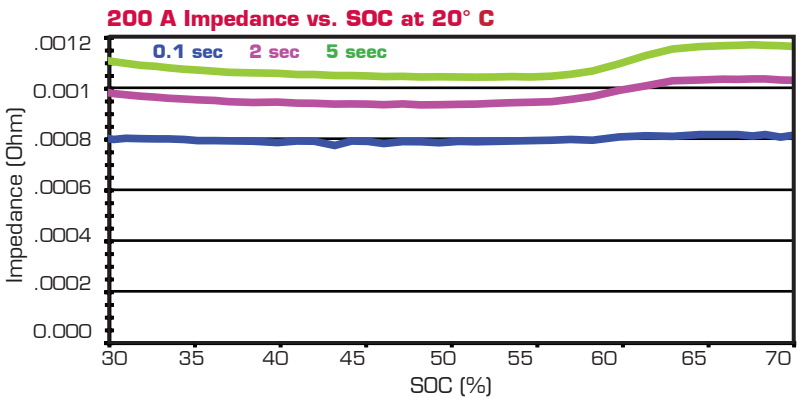
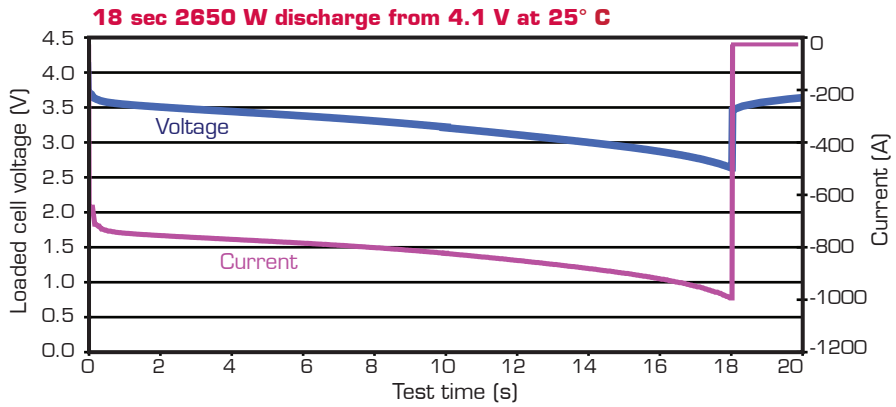
Battery-level safety

- Incorporation of several levels of redundant safety features to prevent abuse conditions such as overcharge, over-discharge, and short circuit
- Battery protection controller at battery pack level
- CanProbe at module level
- Dual vents and shutdown separator at cell level









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Sizing by
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