



Primary CF_x Hybrid Cell



Li/CF_x-MnO₂ Primary Electrochemistry
Rate-Optimized, High Energy Pouch Cell

Features and Benefits

- Higher volumetric capacity and lower weight than Li/MnO₂
- Optimized electrolyte for low-temperature performance
 - Minimal voltage delay at -40°C (-40°F)
- No maintenance required
 - Low self discharge: 0.7%/year at 20°C (68°F)
 - Long shelf life:
 - >7 years at 20°C (68°F)
 - 5 years at ≤ 45°C (113°F)
- Shut-down separator
- Safety demonstrated to UN/DOT 38.3
 - Altitude, thermal, vibration, shock and impact
 - External short circuit and forced discharge
- Improved battery packaging efficiency over cylindrical cells

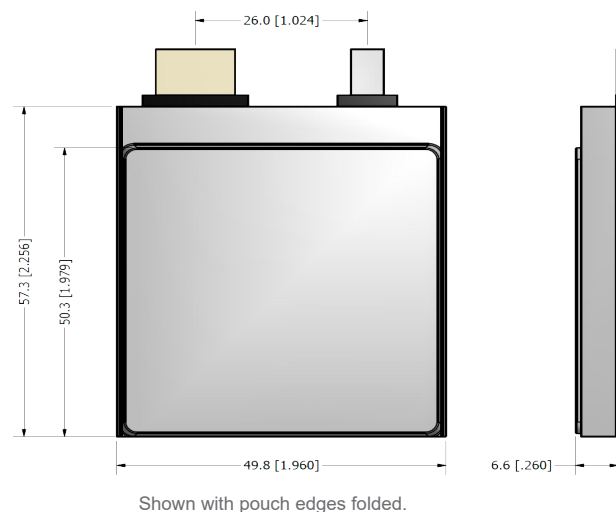
Applications

- High-power applications at low temperatures
- Portable one-time use power
- Survival and emergency equipment
- Surveillance
- Unmanned aerial vehicle (UAV), underwater unmanned vehicle (UUV) and autonomous underwater vehicle (AUV)

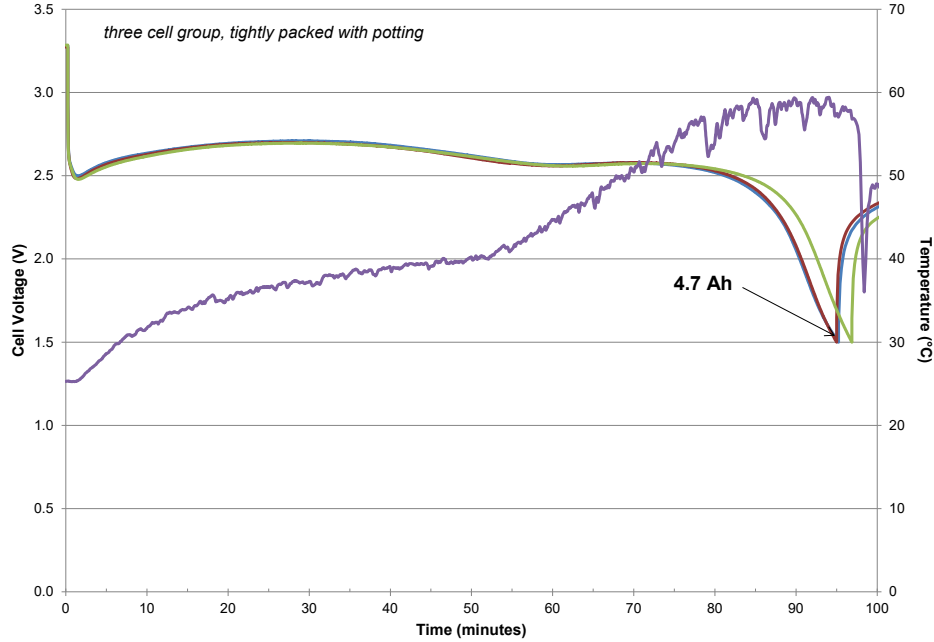
Safe, Reliable, Lightweight Cell for Operation at Extreme Temperatures

Specifications

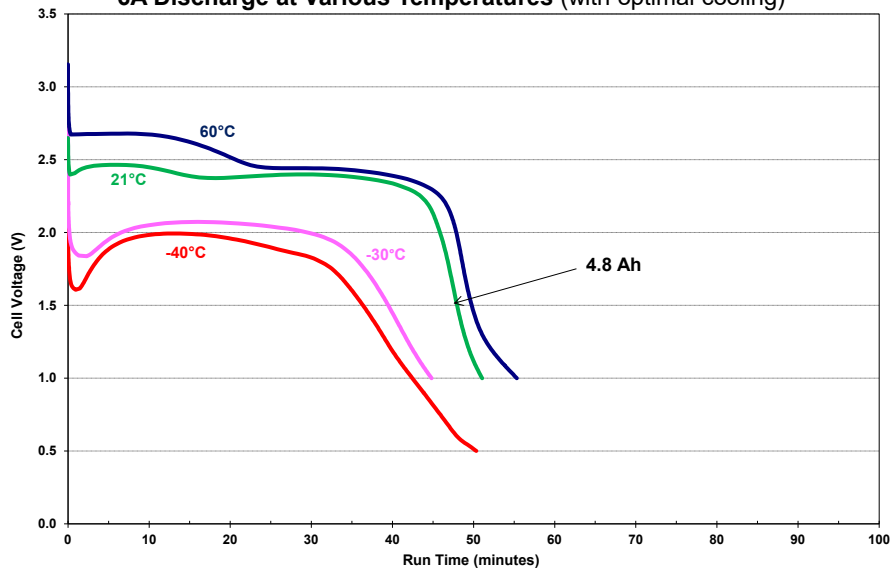
Part Number	LCF-136	
Weight	29.5 g	
Continuous Current ²	3A at 20°C (68°F)	
Maximum Pulse Current ²	10A for 20 sec	
Discharge/Load Current	0.5A	2.0A
Nominal Voltage	2.6V	2.5V
Voltage Range	3.4-1.5V	3.3-1.5V
Capacity ¹	4.9Ah	4.6Ah
Specific Energy ¹	415 Wh/kg	390 Wh/kg
Energy Density ¹	640 Wh/L	610 Wh/L
Operating/Storage Temperature	-40 to +60°C (-40 to +140°F)	
Transportation	UN 3090 Class 9	
¹ Determined with either a 0.5A or 2A continuous discharge, as noted		
² Thermal management required to achieve higher discharge rates - contact EaglePicher for specific application details		



3A Continuous Discharge at 25°C of LCF-136 Cells



6A Discharge at Various Temperatures (with optimal cooling)



Maximum Continuous Current Capability¹

Ambient/Operating Temperature °C (°F)	Maximum Continuous Current (A)
-20 (-4)	8
0 (32)	7
20 (68)	6
50 (122)	3

¹ Single-cell capability; depending upon the resulting heat dissipation capabilities once integrated into a battery within the application, these best-case continuous discharge rates could be de-rated by 30-50% from these maximums if unable to shed the generated heat from the cell - conductive mounting and convective airflow required for optimal performance ($\geq 17\text{W/m}^2\text{K}$).

Capacity De-rating as a Function of Maximum Power

Discharge Rate (W)	Capacity (Ah)
0.1	4.9
1.0	4.9
2.5	4.8
5.0	4.6
10.0	4.5
22.3	4.2