



# 60 Amp Hour Cell

NANO LITHIUM-TITANATE BATTERY CELL

<b>Performance Characteristics</b>		<b>Nominal Values</b>
Nominal Voltage		2.26 V
Nominal capacity (60 amp [1 C rate] at 25°C, CCCV charge)		64 Ah
Typical high rate capacity (360 amp [6 C rate] at 25°C, CCCV charge)		60 Ah
Typical energy (60 amp [1 C rate] at 25°C, CCCV charge)		141.3 Wh
Pulse power (600 Amp [10 C rate], 10 sec pulse, 50% SOC at 25°C) (Discharge/Charge)		1,250 W / 1,475 W
Pulse power (FreedomCar, 10 sec pulse, 50% SOC at 25°C) (Discharge/Charge)		2,455 W / 4,135 W
Energy density		168 Wh/l
Power density <sup>1</sup>		2,916 W/l
Specific energy		77 Wh/kg
Specific power <sup>1</sup>		1,333 W/kg
Internal charge impedance (10 sec DC pulse 50% SOC, at 25°C)		0.38 mΩ
Internal discharge impedance (10 sec DC pulse 50% SOC, at 25°C)		0.40 mΩ
Max continuous charge		360 A
Max continuous discharge		360 A
Pulse charge/discharge rate (10 sec pulse)		600 A max
Internal impedance (1 hertz AC, 10% SOC 25°C)		0.6 mΩ
<b>Life Characteristics</b>		
Cycle life at 2C charge & 2C discharge, 100% DOD, 25°C		>16,000 to 80% initial capacity
Cycle life at 2C charge & 2C discharge, 100% DOD, 55°C		> 4,000 to 80% initial capacity
Calendar life at 25°C		>25 years
<b>Temperature Limits</b>		
Operating and storage temperature range <sup>2</sup>		-40°C to +55°C cell temperature
<b>Voltage Limits <sup>3</sup></b>		
Discharge cut off voltage at -40°C to +30°C		1.5 V
Discharge cut off voltage at +30°C to +55°C		1.8 V
Charge cut off voltage at +20°C to +55°C		2.8 V
Charge cut off voltage at -40°C to +20°C		2.9 V
<b>Cell Dimensions <sup>4</sup></b>		
Width (W) x Height (H) x Thickness (T; compressed)		256 mm x 259 mm x 12.7 mm
Weight		1.84 kg
<b>Design Standards</b>		
Transportation specifications		UN 3090, UN 3480 compliant

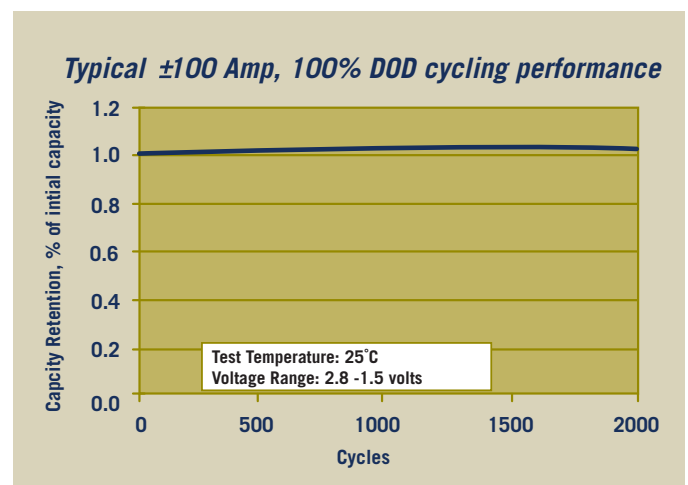
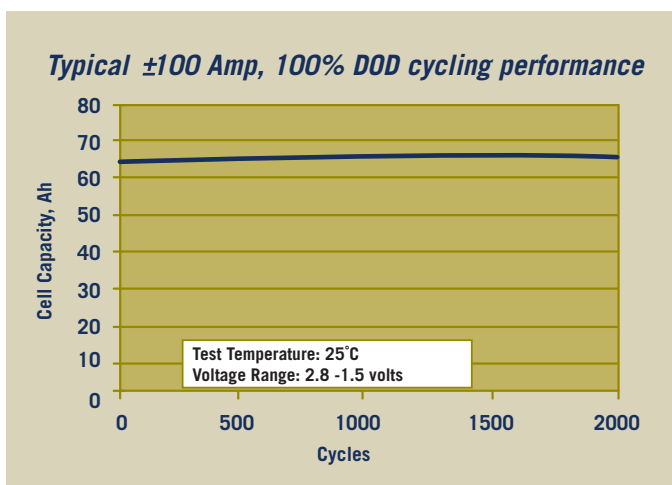
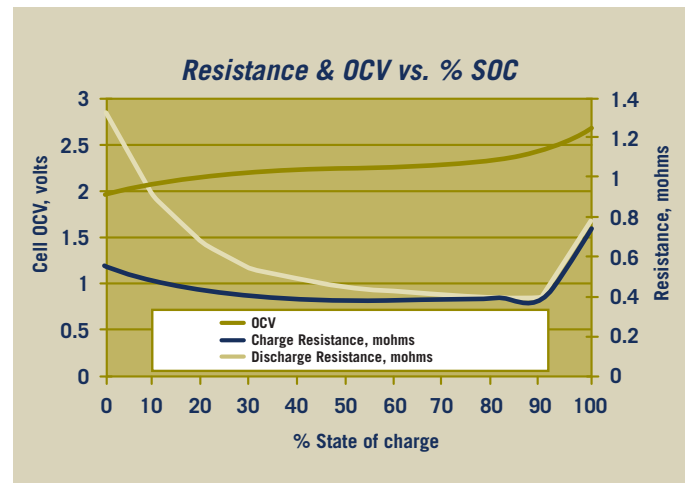
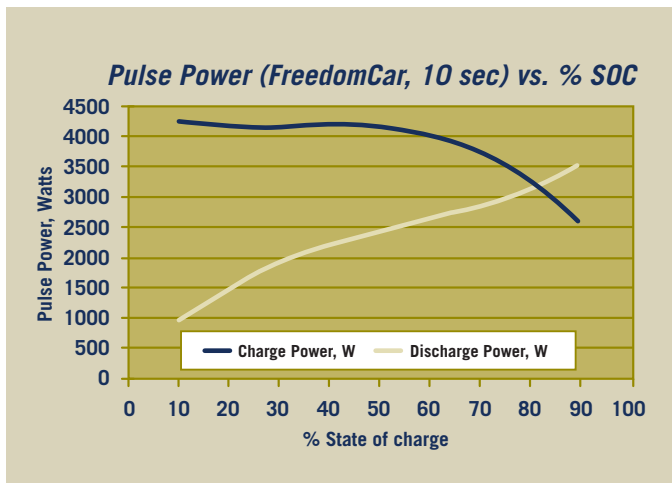
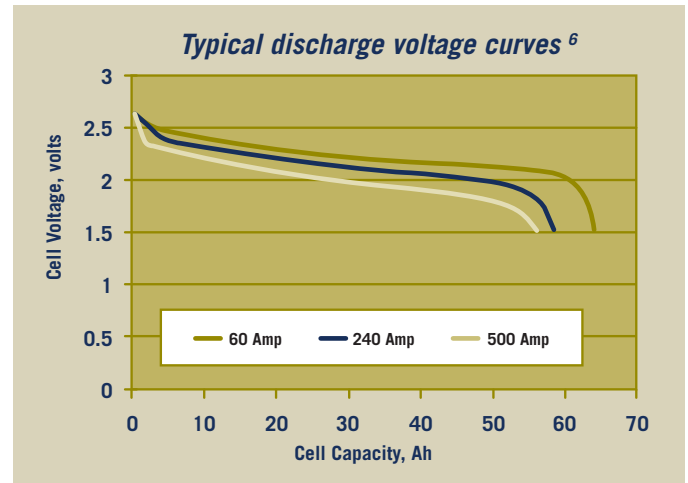
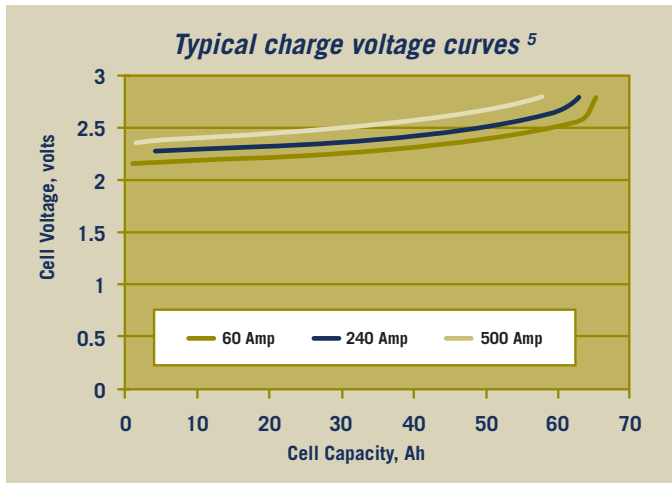
<sup>1</sup> Power at 25°C for 10 sec is calculated using FreedomCar discharge formulas.

<sup>2</sup> Optimal storage temperature is 25°C.

<sup>3</sup> In battery systems, the battery management system must enforce the voltage limits at the individual cell level.

<sup>4</sup> Cell terminal heights are not included in the stated cell dimensions.

# 60 Amp Hour Cell CONTINUED



<sup>5</sup> Constant current discharge prior to test.

<sup>6</sup> Constant current charge prior to test.