

EnerChip™ CBC005

Rechargeable Energy Storage Device: 5μAh, 3.8V

Features

- All Solid State Construction
- Designed for Wirebond Attachment
- Lead-Free Reflow Tolerant
- Thousands of Recharge Cycles
- Low Self-Discharge
- Fast Recharge
- Eco-Friendly, RoHS-Compliant
- Smallest Commercially Available Rechargeable Energy Storage Device
- Flat Output Voltage Profile
- Wire Bond or Solder Bump attachment

Electrical Properties

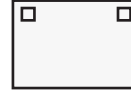
Output voltage (nominal): 3.8V
Capacity (nominal): 5μAh
Charging source: 4.1V
Recharge time to 80%: 15 minutes
Charge/discharge cycles: >5000 at 10% discharge

Physical Properties

Die size (mm): 1.7 x 2.25 x 0.175
Operating temperature: -20 °C to 70 °C
Storage temperature: -40 °C to 125 °C

Applications

- **Standby supply** for non-volatile SRAM, real-time clocks, controllers, supply supervisors, and other system-critical components.
- **Portable devices** requiring ultra-slim profile and small footprint backup power source.
- **Localized power source** to keep microcontrollers and other devices alert in standby mode.
- **Power bridging** to provide backup power to system during exchange of main battery.



*Bare die CBC005 suitable for wirebonding.
Dimensions: 1.7mm x 2.25mm x 0.175mm.
[Not to scale.]*

The EnerChip™ CBC005 is a solid state, thin film, rechargeable energy storage device rated at 5μAh at 3.8V. It is ideal as a localized on-board power source to retain memory or maintain real-time clock function in mobile systems when main power is interrupted. The CBC005 is the smallest rechargeable energy storage device available to Original Equipment Manufacturers (OEMs) and is a superior alternative to button and coin cell batteries and super-capacitors in handheld devices.

Board mounting area of the CBC005 is less than 1/2 the area of a 1210 (3225 metric) surface mount device and less than 1/4 the thickness. Such dimensions make the CBC005 ideal for space-constrained applications.

Because of their solid state design, EnerChip™ energy storage devices are able to withstand solder reflow temperatures and can be processed in high-volume manufacturing lines similar to conventional semiconductor devices. In contrast to traditional rechargeable batteries and super-capacitors, there are no harmful gases, liquids or special handling procedures associated with the EnerChip™.

The CBC005 is based on a patented, all solid state, rechargeable lithium cell with a nominal 3.8V output. Recharge is fast and simple with a direct connection to a 4.1V voltage source and no current limiting components required. Recharge time is 15 minutes to 80% capacity. A robust design offers thousands of charge/discharge cycles. The CBC005 is delivered as a 1.7mm x 2.25mm x 0.175mm bare die with two wirebondable pads for co-packaging with other components or chip-on-board mounting. Die are shipped in tape-and-reel, waffle packs, and trays.

Operating Characteristics

Parameter		Condition	Min	Typical	Max	Units
Discharge Cutoff Voltage		25 °C	3.0 ⁽¹⁾	-	-	V
Charge Voltage		25 °C	4.0 ⁽²⁾	4.1	4.2	V
Self-Discharge (average; 25 °C)		Non-recoverable	-	2.5	-	% per year
		Recoverable	-	1.5 ⁽³⁾	-	% per year
Operating Temperature		-	-20	-	+70	°C
Storage Temperature		-	-40	-	+125 ⁽⁴⁾	°C
Cell Resistance (25 °C)		Charge cycle 2	-	7	11	kΩ
		Charge cycle 1000	-	31	48	
Recharge Cycles (to 80% of rated capacity; 4.1V charge voltage)	25 °C	10% depth-of-discharge	5000	-	-	cycles
		50% depth-of-discharge	1000	-	-	cycles
	40 °C	10% depth-of-discharge	2500	-	-	cycles
		50% depth-of-discharge	500	-	-	cycles
Recharge Time (to 80% of rated capacity; 4.1V charge voltage)		Charge cycle 2	-	11	22	minutes
		Charge cycle 1000	-	45	70	
Discharge Capacity		400nA discharge; 25 °C	5.0	-	-	μAh

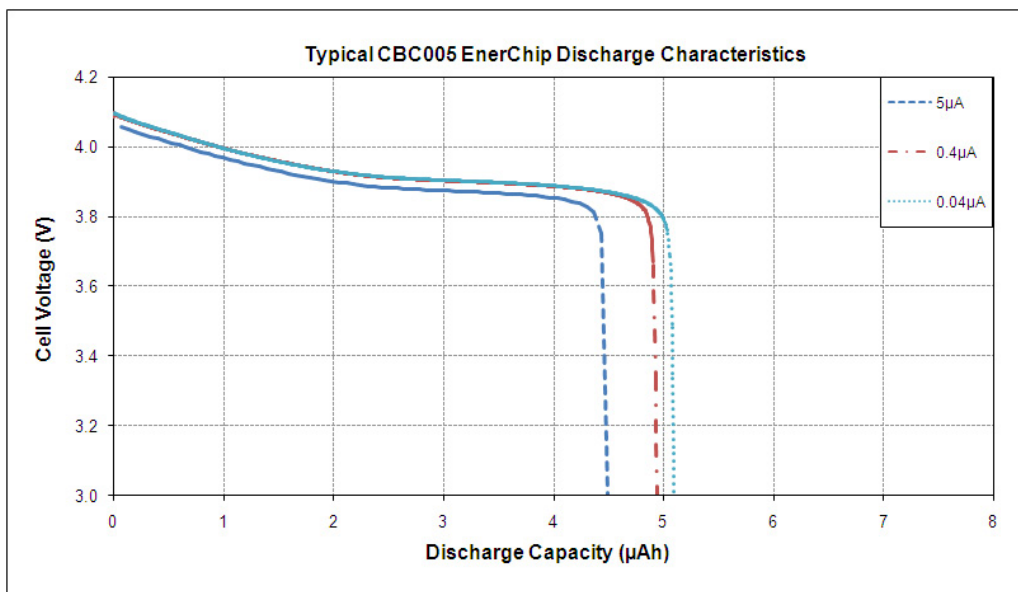
⁽¹⁾ Failure to cutoff the discharge voltage at 3.0V will result in cell performance degradation.

⁽²⁾ Charging at 4.0V will charge the cell to approximately 70% of its rated capacity.

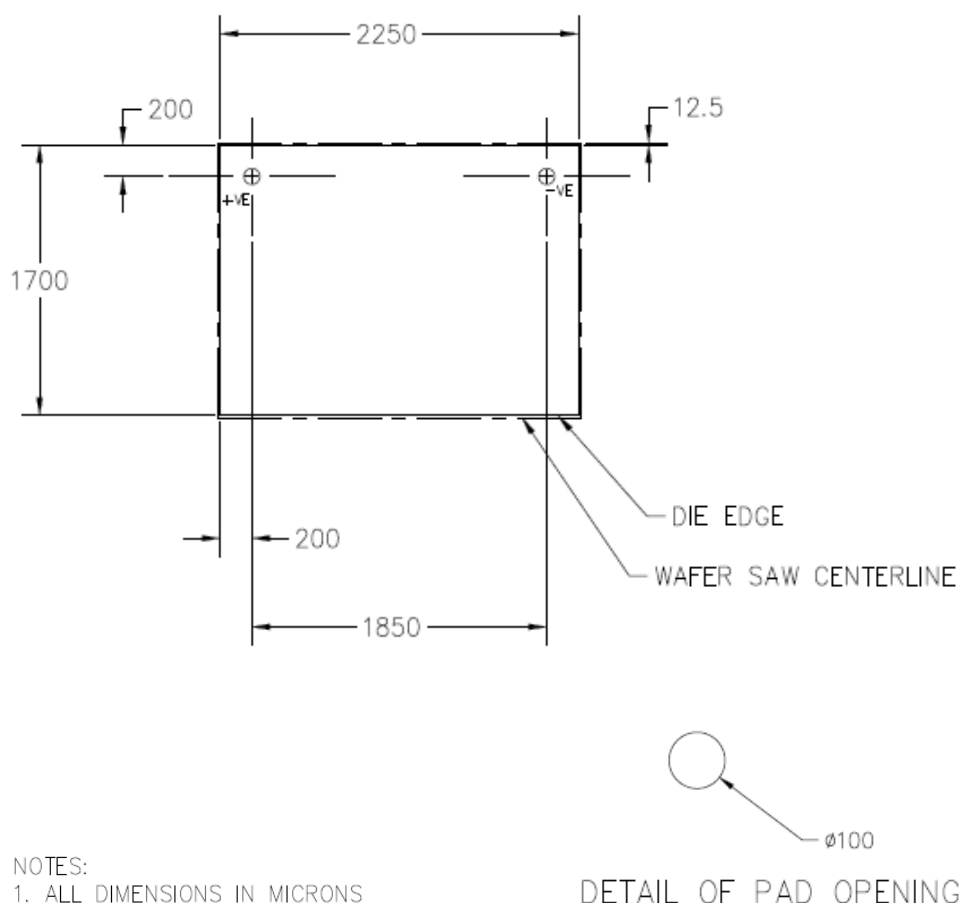
⁽³⁾ First month recoverable self-discharge is 5% average.

⁽⁴⁾ Storage temperature is specified for uncharged EnerChip.

Note: All specifications contained within this document are subject to change without notice.



CBC005 Bare Die Dimensions



Ordering Information

EnerChip Part Number	Description	Notes
CBC005-BDC-WP	5μAh EnerChip Bare Die, Waffle Pack	Contact Cymbet
CBC005-BUC-WP	5μAh EnerChip Bare Die Solder Bumped, Waffle Pack	Contact Cymbet

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