

Rechargeable Solid State Energy Storage: 50μAh, 3.8V

Features

- All Solid State Construction
- SMT Package and Process
- Lead-Free Reflow Tolerant
- Thousands of Recharge Cycles
- Low Self-Discharge
- Eco-Friendly, RoHS Compliant



8 mm x 8 mm
QFN SMT Package



5.7 mm x 6.1 mm
Bare Die

Electrical Properties

Output voltage:	3.8V
Capacity (typical):	50μAh
Charging source:	4.00V to 4.15V
Recharge time to 80%:	20 minutes
Charge/Discharge cycles:	>5000 to 10% DOD

Physical Properties

Package size:	8 mm x 8 mm
Operating temperature:	-20 °C to 70 °C
Storage temperature:	-40 °C to 125 °C

Applications

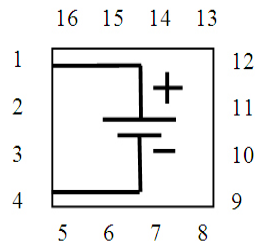
- **Standby supply** for non-volatile SRAM, real-time clocks, controllers, supply supervisors, and other system-critical components.
- **Wireless sensors and RFID tags** and other powered, low duty cycle applications.
- **Localized power source** to keep microcontrollers and other devices alert in standby mode.
- **Power bridging** to provide backup power to system during exchange of main batteries.
- **Energy Harvesting** by coupling the EnerChip with energy transducers such as solar panels.
- **Embedded Energy** where bare die can be embedded into modules or co-packaged with other ICs.

The EnerChip™ CBC050 is a surface-mount, solid state, rechargeable energy storage device rated for 50μAh at 3.8V. It is ideal as a localized, on-board power source for SRAMs, real-time clocks and microcontrollers which require standby power to retain time or data. It is also suitable for RFID tags, smart sensors, and remote applications which require a miniature, low-cost, and rugged power source. For many applications, the CBC050 is a superior alternative to coin cell batteries and supercapacitors.

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

The EnerChip recharge is fast and simple, with a direct connection to a 4.1V voltage source and no current limiting components. Recharge time is 20 minutes to 80% capacity. Robust design offers thousands of charge/discharge cycles. The CBC050 is packaged in an 8 mm x 8 mm quad flat package. It is available in reels for use with automatic insertion equipment.

Pin Number(s)	Description
1	V+
4	V-
2,3	NIC
5-16	NIC
Note: NIC = No Internal Connection	



CBC050 Schematic - Top View

EnerChip™ CBC050 Solid State Energy Storage

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	4.3	V	
Pulse Discharge Current	25 °C	300 ⁽³⁾	-	-	μA	
Cell Resistance (25 °C)	Charge cycle 2	-	750	2000	Ω	
	Charge cycle 1000	-	4200	7000		
Self-Discharge (5yr average; 25 °C)	Non-recoverable	-	2.5	-	% per year	
	Recoverable	-	1.5 ⁽⁴⁾	-	% per year	
Operating Temperature	-	-20	25	+70	°C	
Storage Temperature	-	-40	-	125 ⁽⁵⁾	°C	
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	-	20	35	minutes	
	Charge cycle 1000	-	60	95		
Capacity	100μA discharge; 25 °C	50	-	-	μAh	

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

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

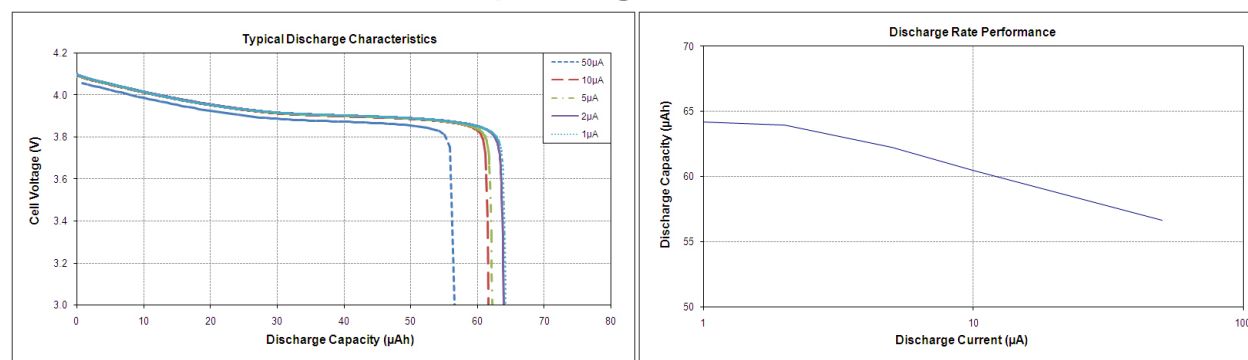
⁽³⁾ Typical pulse duration = 20 milliseconds.

⁽⁴⁾ First month recoverable self-discharge is 5% average.

⁽⁵⁾ Storage temperature is for uncharged EnerChip.

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

EnerChip Discharge Characteristics



Ordering Information

EnerChip Part Number	Description	Notes
CBC050-M8C	50μAh in 16-pin M8 QFN Package	tube
CBC050-M8C-TR1	50μAh in 16-pin M8 QFN Package	tape & reel 1000 pcs
CBC050-M8C-TR5	50μAh in 16-pin M8 QFN Package	tape & reel 5000 pcs
CBC050-M8C-WP	50μAh in 16-pin M8 QFN Package	waffle pack
CBC050-BDC-WP	50μAh Bare Die	Contact Cymbet
CBC050-BUC-WP	50μAh Bumped Bare Die	Contact Cymbet

