

October 26, 2023
Maxell, Ltd.

Development of cylindrical all-solid-state battery (PSB23280) that can also be applied to main power applications

200mAh samples to be shipped from January 2024



Sample of 200mAh cylindrical all-solid-state battery (PSB23280)

Maxell, Ltd. (President and Representative Director: Keiji Nakamura / hereafter, “Maxell”) is developing a 200mAh cylindrical all-solid-state battery with 25 times the capacity of a ceramic packaged all-solid-state battery (PSB401010H) that uses a sulfide-based solid electrolyte and has been in mass production since June 2023. The PSB23280 cylindrical all-solid-state battery achieves its large capacity due to a newly-developed cylindrical exterior body with high sealability*¹, while retaining long-term reliability*² and heat resistance equivalent to those of existing products*³.

Maxell is planning to ship samples from late January 2024.

Maxell has been developing and commercializing batteries in line with market needs, including the development of ceramic packaged all-solid-state batteries capable of being surface mounted on boards, and specialized high voltage, high output bipolar all-solid-state batteries, and is supplying these samples at present. The wide temperature range and long-term reliability characteristics of Maxell’s all-solid-state batteries are evaluated as “batteries that can contribute to social issues” by the customers who used the samples.

In addition, there has recently been an increase in the need for larger capacity all-solid-state batteries that can also be applied to main power applications including sensing applications such as infrastructure monitoring. The new cylindrical all-solid-state battery under development is responding to such requirement.

The large capacity of this cylindrical all-solid-state battery was realized by comprehensively reviewing its electrode structure and exterior body. For the electrode structure, a process that enables filling to a higher density was introduced to increase the size of the electrode. For the exterior body, the shape was changed from cubic to cylindrical, and a new cylindrical exterior body that can maintain sealability equivalent to that of a ceramic packaged all-solid-state battery was developed. Large capacity is thereby realized while maintaining the various characteristics of Maxell’s existing all-solid-state batteries, such as long life and heat resistance.

The further application and development of this electrode structure and exterior body technology will help develop all-solid-state battery products compatible with various market needs.

Features of the PSB23280 cylindrical all-solid-state battery

1. 25 times the capacity (200mAh) of ceramic packaged all-solid-state batteries (PSB401010H)
2. Wide temperature range (-50°C to +125°C)
3. Size can be customized according to market needs

To solve various social issues, Maxell is developing reliable, high-performance all-solid-state batteries that can be used in areas where existing batteries cannot be used, by focusing on the following four facets: long lifetime, high temperature resistance, high output, and large capacity. Maxell will continuously enhance its range of all-solid-state batteries and also consider module products that combine technologies such as wireless power supply and energy harvesting in addition to all-solid-state batteries to contribute to solving social issues.

*1 High sealability: In a helium leak test, a level of 10^{-11} (Pa·m³/sec) was achieved. The sealability of a general coin battery is 10^{-8} (Pa·m³/sec). Refer to JIS Z 2330.

*2 Long-term reliability: Maxell's life prediction result based on various evaluations and analyses.

*3 Existing products: PSB401010H ceramic packaged all-solid-state battery. PSB401515H is not considered for comparison as it is development product.

All-solid-state battery webpage

https://biz.maxell.com/en/rechargeable_batteries/allsolidstate.html

Contacts

Marketing & Sales Div., Maxell, Ltd.

https://biz.maxell.com/en/rechargeable_batteries/inquiry_form_input1.html

Image of cylindrical all-solid-state battery (PSB23280)

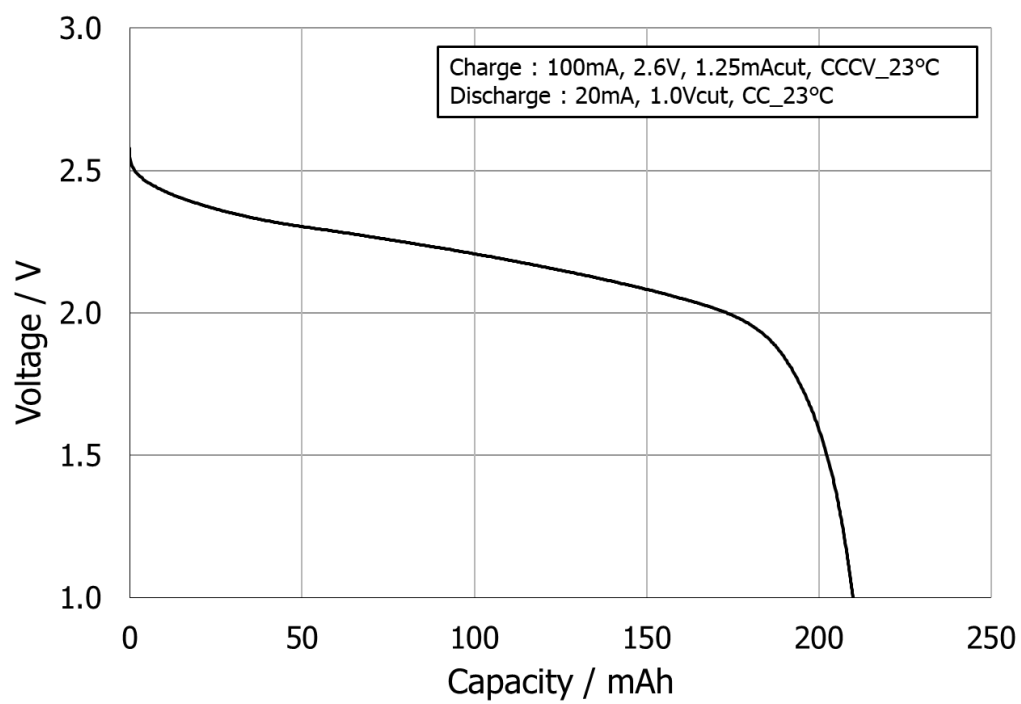
Sample of cylindrical all-solid-state battery (PSB23280)

Specifications of PSB23280 cylindrical all-solid-state battery

Model		PSB23280
Dimension	Diameter (mm)	22.7
	Height (mm)	27.3
Charge (CCCV)	Voltage (V)	2.6
	Temperature (°C)	-20 to +105
Discharge (CC)	Lower voltage (V)	0.0
	Temperature (°C)	-50 to +125
Nominal voltage (V)		2.3
Nominal capacity (mAh)		200

* Specifications may be changed without notice.

Discharge characteristic



Discharge characteristic of a cylindrical all-solid-state battery (PSB23280)