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News Release

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Maxell, Ltd.

Maxell to Begin Joint Research with JAXA on All-Solid-State Battery Technology

Selected for the "JAXA-STEPS", aiming to reduce spacecraft weight and increase design flexibility by enabling high-temperature operation

Maxell, Ltd. (President and Representative Director: Keiji Nakamura; hereinafter "Maxell") has been selected by the Japan Aerospace Exploration Agency ("JAXA") for its JAXA Space Technologies Rapid Evaluation Program on Small Satellite ("JAXA-STEPS"), a space technology demonstration acceleration program. Maxell has proposed a theme titled "Development and Demonstration of High-Heat-Resistant All-Solid-State Batteries to Maximize Spacecraft[*1] Missions" and has been selected for the program.

JAXA-STEPS is a program designed to drive and accelerate research and development of future missions and technologies essential to both the public and private sectors by utilizing small satellites to conduct rapid and timely demonstrations. Maxell and JAXA have now started joint research on this theme, with the aim of achieving both "overall satellite weight reduction" and "enhanced design flexibility" for small satellites by minimizing the amount of temperature control equipment required.

In recent years, as the number of satellite launches has surged and mission durations have become longer, there has been an urgent need for lighter, higher-performance satellite capable of stable long-term operation.
One of the key constraints in addressing these challenges is the temperature tolerance of conventional liquid-based lithium-ion batteries (LIBs), which have been widely used as power sources for satellites.
In space, satellites may be exposed to both high and low temperatures.
For example, temperatures of around 60°C, which are near the upper operating temperature limit of LIBs, impose severe conditions on the battery and lead to a significant reduction in its lifetime. Furthermore, temperatures exceeding 100°C pose risks of damage and ignition, necessitating the use of specialized temperature control systems. As a result, increases in spacecraft weight and reduced design flexibility have been unavoidable.

Maxell has long focused on the development of all-solid-state batteries that are able to maintain high safety even at temperatures exceeding 100°C. In this joint research, in addition to achieving energy density comparable to that of conventional LIBs, Maxell aims to establish stable output performance and long service life under the extremely wide temperature range found in space environment, by utilizing the characteristics of these all-solid-state batteries.

This joint research will include demonstration of all-solid-state batteries intended for

installation into satellites. By incorporating all-solid-state batteries into satellites, it becomes possible to further reduce satellite weight and achieve both overall weight reduction and enhanced design flexibility, by minimizing temperature control equipment.

Under its corporate byline, “Micro batteries. Maximum impact.”, Maxell embodies the philosophy of creating significant value through small batteries by advancing the development of high-performance and highly reliable all-solid-state batteries across four key areas: long life, high heat resistance, high output, and large capacity. Leveraging the results of this research, Maxell will expand the range of applications for all-solid-state batteries and accelerate the provision of battery solutions that directly address customer challenges.

*1 Spacecraft: A general term for machines and vehicles designed for operation in outer space, including a satellite.

All-solid-state battery webpage
https://biz.maxell.com/en/rechargeable_batteries/allsolidstate.html

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

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