

February 28, 2023

NEXTY Electronics Corporation

Development of a Substrate for Large-Capacity Sweep Energy Storage System Reuses Electrified Vehicle Batteries

Toyota Tsusho Group's electronics trading company, NEXTY Electronics Corporation (Head Office: Minato-ku, Tokyo; President: Yasuhiro Kakihara; hereinafter referred to as "NEXTY Electronics"), has developed a substrate for large-capacity sweep energy storage systems that reuses batteries from electrified vehicles (HEV, PHEV, BEV, FCEV). As described in a press release *¹ by JERA Co., Inc. (hereinafter referred to as "JERA") and Toyota Motor Corporation (hereinafter referred to as Toyota Motor), this substrate has been installed in the world's first *² large-capacity sweep energy storage system using batteries reclaimed from electrified vehicles.

1. Background

Demand for storage batteries is expected to grow as a necessary way to adapt to the spread of renewable energy so as to reduce CO₂ emissions, which is essential to achieving carbon neutrality. In addition, environmentally-friendly action, such as collecting used electric vehicle batteries and making effective use of them as storage batteries, is a must due to limited reserves of battery materials like cobalt and lithium.

To cope with the situation, NEXTY Electronics customer Toyota Motor has been examining how to establish battery reuse technology since 2018. Together with its joint partner JERA, Toyota Motor has begun operating a sweep energy storage system, including a power grid connection, since October 2022.

2. Development

The sweep energy storage system consists of power substrates forming a bypass path and a control board that monitors battery status and controls the bypass path.

The power substrates require transistor switching control and thermal design technology to switch transistor bypass paths and deliver a large current of 100A or higher to each battery or bypass connected in series. In addition, the control board, which can control the charge and discharge amount both arbitrarily and individually, measures total battery voltage and issues commands to the power substrates. This requires an analog circuit knowledge concerning signal control and noise suppression.

Since April 2019, NEXTY Electronics has been involved in developing the sweep energy storage system Toyota Motor has been studying. Correctly measuring the control board's remaining battery level and efficiently switching power substrates successfully increases the energy storage system's overall output.

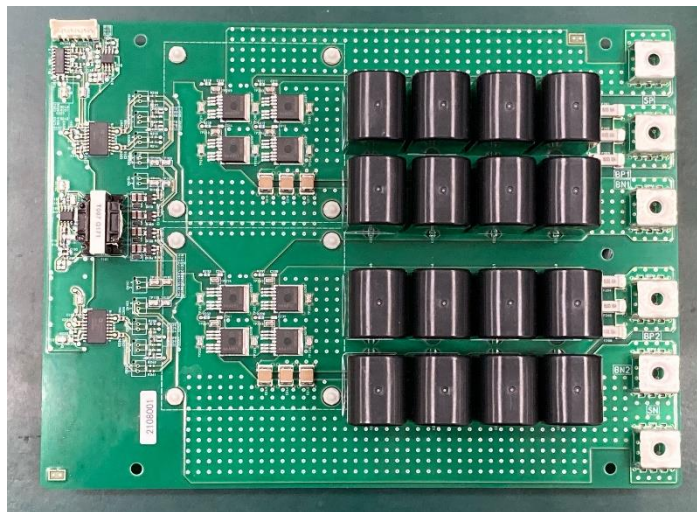
NEXTY Electronics will proactively address social issues to achieve carbon neutrality, including the development of substrates for sweep energy storage systems.

*1: October 27, 2022, press release

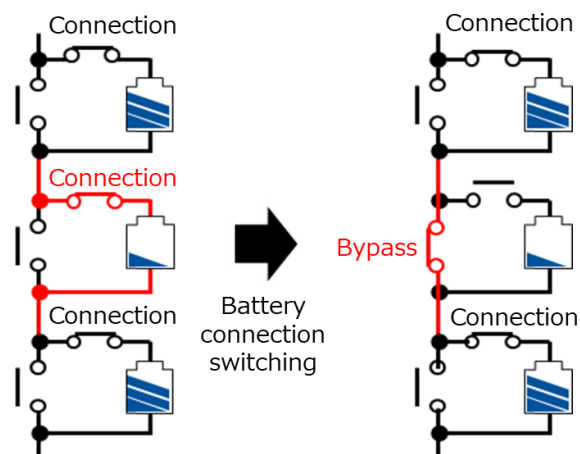
<https://global.toyota/en/newsroom/corporate/38149071.html>

*2: As of October 2022, announced by Toyota Motor (in-house research)

[The power substrate developed]



[Sweep energy storage system overview]



■ About NEXTY Electronics

NEXTY Electronics, an electronics trading company headquartered in Tokyo, Japan is one of the core members of the Toyota Tsusho Group's electronics business and boasts top-of-class scale in the automotive electronics sector. With its core strengths of technology and products, NEXTY Electronics meets customer and global needs in a broad range of areas and provides solutions to the challenges faced by society. It achieves this by actively adapting the autonomous driving, connected and other leading-edge technologies it has cultivated in the automotive electronics sector for use in other industries. It offers optimum global solutions that transcend regions and business boundaries by leveraging the Toyota Tsusho Group's global network and intensifying its discovery of the cutting-edge proprietary technologies of startups from around the world. Visit the links below for more information.

NEXTY Electronics website: <https://www.nexty-ele.com/english/>

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