

June 22, 2021

Development of the world's first maintenance-free electronic shelf labeling system using film-type perovskite solar cells

**Enecoat Technologies Co., Ltd.
Ricoh Electronic Devices Co., Ltd.
NICHICON CORPORATION.**

Enecoat Technologies Co., Ltd., Ricoh Electronic Device Co., Ltd., and NICHICON CORPORATION have the world's first electronic shelf labeling system that utilizes film-type perovskite solar cells.

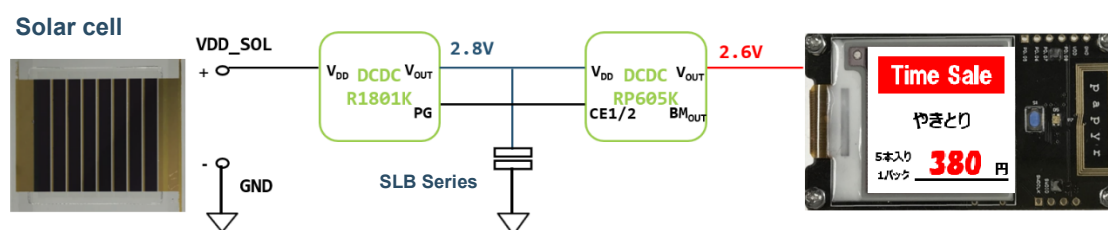
The product will be displayed at NICHICON's booth at TECHNO-FRONTIER 2021's 36th Power System Japan Expo.

Overview and Development Background

Electronic shelf labels often use primary batteries, but they have the problem of requiring regular battery replacement due to their short service life. Although one of the main features is that the display screen can be freely overwritten, there is the problem of the number of overwrites is limited by battery life. Overcoming these issues will open up the potential of the utilization of electronic shelf labels. These challenges can be overcome with the combination of Film-type perovskite solar cells with high conversion efficiency even in low light such as indoor environments. Secondary batteries that can be charged with a small current and have long-life charge / discharge cycle characteristics, and low power consumption required for energy harvesting in this application.

Enecoat Technologies Co., Ltd., Ricoh Electronic Devices Co., Ltd., and NICHICON CORPORATION have pooled their resources to develop a maintenance-free electronic shelf labeling system. The electricity generated by the film-type perovskite solar cell is stepped down by the low current consumption buck DC-DC converter for energy harvesting, and stored in a small li-ion rechargeable battery. The stored energy is converted by a low current buck-boost DC-DC converter to drive the electronic paper on the display and a wireless module with built-in Bluetooth. The overwritten information of the display screen can be received via Bluetooth. This allows for maintenance-free and timely overwriting to occur simultaneously.

Electronic labeling system schematic



Reference

■Enecoat Technologies Co., Ltd.

A startup company from Kyoto University established in January 2018, Enecoat Technologies works on material development and module commercialization of perovskite solar cells.

Aiming at environmental protection and effective use of natural energy, it seeks to create the future of energy with thin-film solar cells.

■Ricoh Electronic Devices Co., Ltd.

Ricoh Electronic Devices develops power supply IC products that are optimal for IoT applications and manufactures them at our own factories in Japan, with the desire to "provide unending, hassle-free assistance to its customers."

■NICHICON CORPORATION

NICHICON is a global electronic component manufacturer that develops, manufactures, and sells aluminum electrolytic capacitors, film capacitors, and circuit products. Its proactively runs corporate strategies in the four market fields of "energy/environment/medical equipment," "automobile/vehicle-related equipment," "white goods/industrial inverter equipment," and "information and communication equipment."

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