

Topics: Capacitors contributing to automobile safety



The use of electronics in automobiles is increasing rapidly. With both EV and traditional automobiles, many of the instruments installed in vehicles today, including steering wheels and brakes, are controlled via electricity. This is because, compared to mechanical controls, using electricity to control vehicle instruments improves usability and efficiency.

On the other hand, many of a vehicle's functions are lost and a vehicle may become inoperable in the event power supply from the lead battery or lithium-ion battery is cut off due to an accident or malfunction. For example, it may even become impossible to unlock the vehicle doors, leaving the occupant trapped inside the vehicle. To prevent such a situation, vehicles are equipped with an emergency backup power supply referred to as power failure prevention. Nippon Chemi-Con proposes backup power supplies made using electric double-layer capacitors (EDLC).

Since 2012, Nippon Chemi-Con has provided the EDLC DLCAP™ for use in vehicle braking energy recovery systems. A braking energy recovery system uses the energy generated during vehicle deceleration via braking (previously wasted energy) to produce electricity that is stored for reuse. Stored electricity is used to power vehicle headlight, air conditioning, and car navigation system operations, and engine control, as well as for engine restart on vehicles with idle reduction engines. This has the benefit of improving fuel economy and reducing CO₂ emissions.

Significant energy is generated when the driver presses the brake while the vehicle is in motion. The efficient storage of this energy requires a large-sized EDLC that achieves low resistance and has a high capacitance. Nippon Chemi-Con commercialized screw terminal type

large-capacitance EDLC for use in such applications. Today, we supply products to companies such as Mazda.

There are also cases of small-sized EDLC being used as a power failure prevention. Thus far, Nippon Chemi-Con has offered a product line specializing in large-sized EDLC. However, we developed the DLCAP™ DKA Series as a small-sized product that responds to demand that is expected to grow moving forward. We started mass production of the DLCAP™ DKA Series in the summer of 2018.

The DKA Series is not only small-sized, but also the terminal shape has been changed from the previous screw terminal type to a radial lead type. This enables the capacitor to be mounted directly to the electronic board, which contributes to capacitor module size reduction and enables compact equipment design that eliminates wasted space. Using proprietary technology, we lowered internal resistance to constrain heat generated by charging and discharging, and provide some of this highest level output in the industry. The DLCAP™ has long contributed to improving the environmental performance of automobiles through their use in braking energy recovery systems. Now, adding the DKA Series as an optimal power failure prevention will contribute to vehicle safety performance. We will continue to expand our product line as we advance into new markets outside the automobile industry, including providing components for IoT-based industrial equipment.



To the left is a product used in braking energy recovery systems. To the right is the DKA Series for power failure prevention.