

Peak Current Assist/Backup using EDLC(Supercap)/Li-Cap

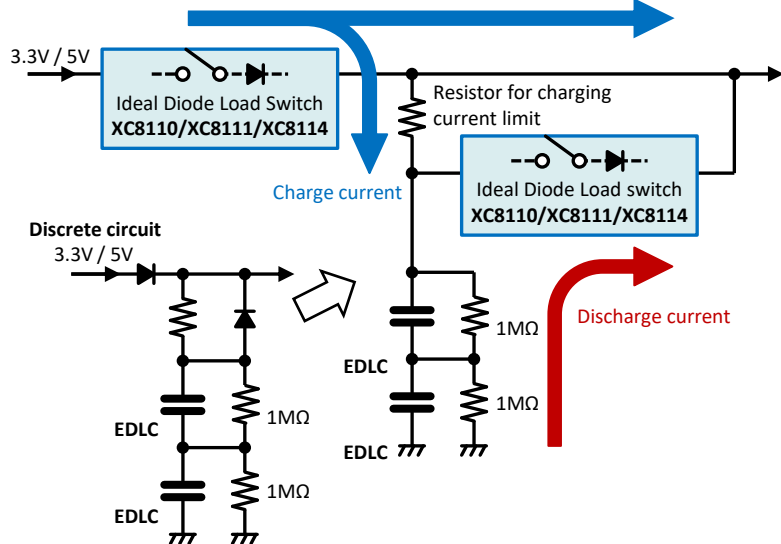
■ Peak current supply for RF communication and motor/solenoid drive

● Technical trend and challenges

- Voltage drops caused by short-term peak currents due to RF communication and drive of motors/solenoids are a major issue.
- For battery-powered devices, measures are needed to prevent the step-up DC/DC from shutting down due to peak current and battery impedance.
- This voltage drop countermeasure can also be used for short-term backup.

● TOREX Proposal : Current assist using EDLC (Supercap)/Li-Cap and ideal diode load switch

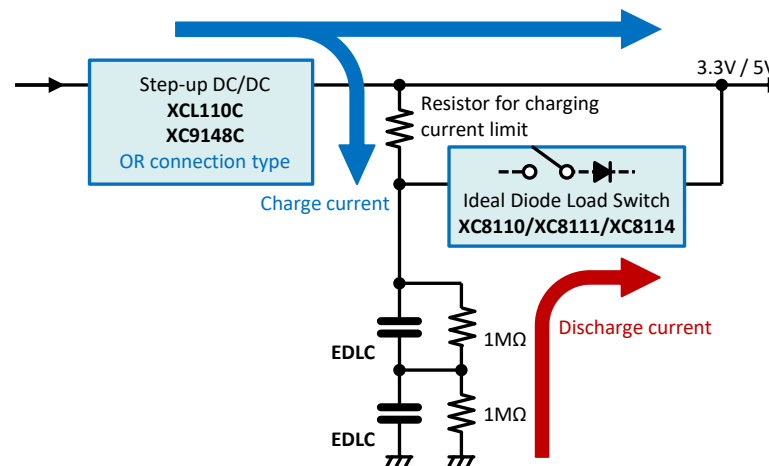
➤ Peak current assist / short-term backup using EDLC/Li-Cap



- By using an ideal diode load switch in a circuit that uses a conventional SBD, voltage drops can be reduced.
- EDLC is 2.5V~2.7V, so use 2 in series for 3.3V/5V lines.
- 3.8V Li-Cap is also becoming popular. Suitable for 3.3V lines.

In the case of Li-Cap, it is necessary to stop discharging at around 2V with a reset IC. **XC6140** is also suitable for voltage monitoring of Li-Cap.

➤ Output current assist for step-up DC/DC



- EDLC is connected to the output of the step-up DC/DC converter to assist with peak current. Because a large capacitance cannot be directly connected to the output side, it is connected to the EDLC via a resistor for current limiting. The output from the EDLC is OR-connected to the output side via an ideal diode load switch.
- By using an OR connection type for the step-up DC/DC, reverse current from the EDLC is prevented after the step-up stops.