

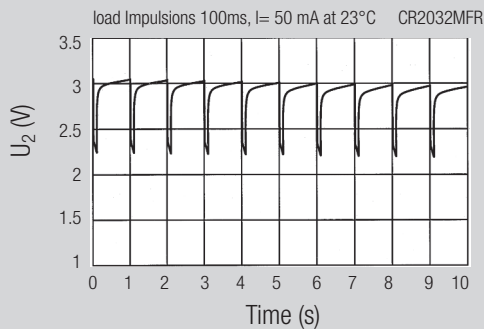
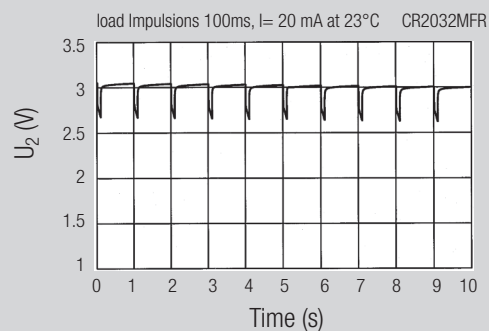
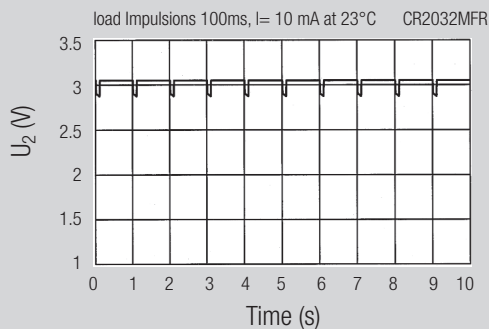
Electrical & Temp. Performance

Pulse discharge characteristics

RENATA Lithium batteries have excellent pulse load characteristics, for example for the transmission of radio signals by remote controls. The following diagrams show the voltage characteristics at pulse loads of 10, 20, and

50 mA during 100 ms, pulse cycle 1 second, at ambient temperature. The voltage drop under load is evident as well as the voltage recovery to almost the original level after a very short time.

Please contact Renata for further details.



Inverse current

Lithium primary batteries are not rechargeable. Therefore, if there is a possibility of electric current flowing from the main power source to the battery, the circuit must include two suitable blocking diodes in series or one blocking diode and one protective resistor in series (refer to drawing in chapter SAFETY GUIDELINES) Use a silicium diode of small inverse current to prevent charging. **The total amount of recharge energy due to leakage by the blocking diodes should not exceed 1% of the battery's nominal capacity during its total service life. A higher input of recharge energy may harm the battery or reduce its performance.**

Example: A CR2450N battery with a nominal capacity of 540 mAh is expected to supply power for 5 years. The amount of tolerable re-charge

energy is 5.4 mAh, corresponding to an inverse current of 0.123 μ A for the total service life¹⁾.

Consequently, a blocking diode with an inverse current not greater than 0.1 μ A should be selected. Please note that the inverse current of blocking diodes varies with temperature.

Short circuits

When lithium batteries are short-circuited, it takes time for the battery voltage to recover, even in case of slight short-circuits. If electrical characteristics are measured while the battery is recovering, the battery may appear to be defective, but is not. Short-circuiting leads to deterioration of the cell capacity. Short-circuiting of batteries must therefore be avoided, except for wave or dip soldering. Use an instrument with a high input impedance (minimum 10 M Ω) for measuring open circuit voltage.

¹⁾ 540 mAh * 1% = 5.4 mAh
5.4 mAh / (5 years * 365 days * 24 hours) = 0.123 μ A