

Technical Info.

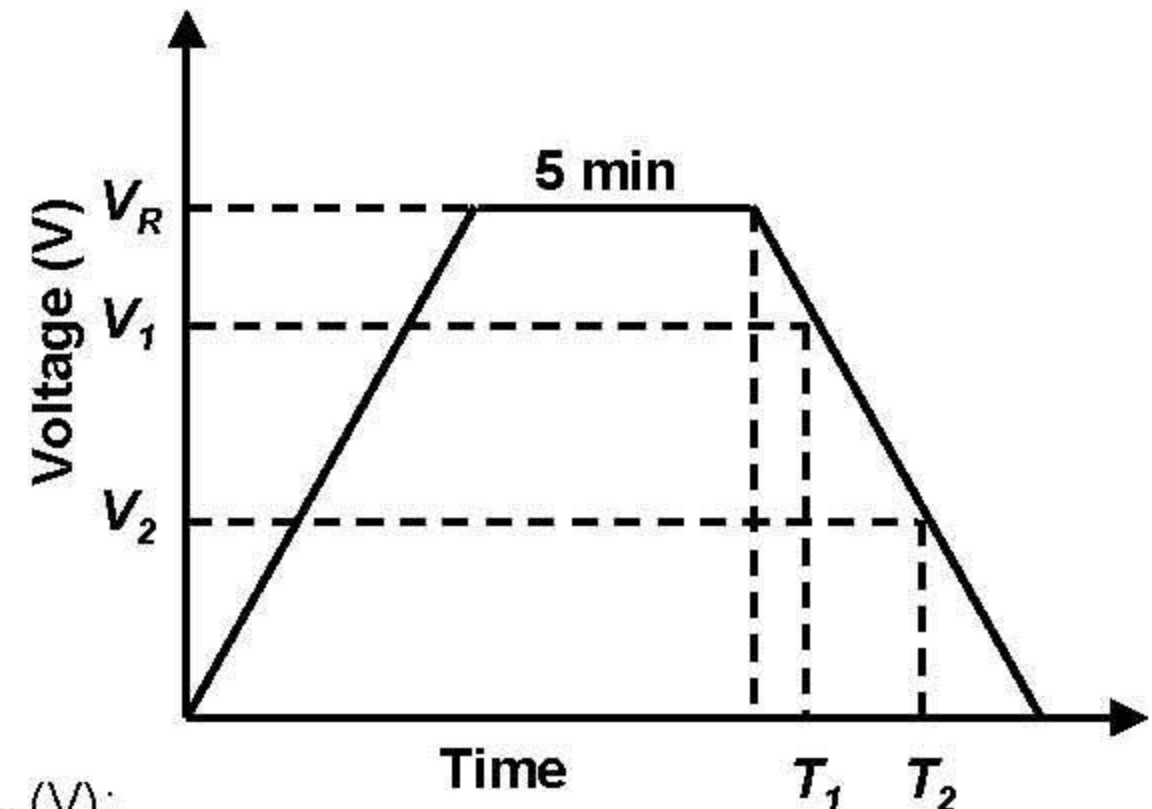
1. The Measurement Condition

1-1 Capacitance

- 1) Constant current charge with 10mA/F to V_R
- 2) Constant voltage charge at V_R for 5min
- 3) Constant current discharge with 10mA/F to 0.1V

$$C = \frac{I \times (T_2 - T_1)}{V_1 - V_2}$$

- Where C is the capacitance (F);
 I is the discharge current (A);
 V_R is the rated voltage (V);
 V_1 is the measurement starting voltage, $0.8 \times V_R$ (V);
 V_2 is the measurement end voltage, $0.4 \times V_R$ (V);
 T_1 is the time from discharge start to reach V_1 (s);
 T_2 is the time from discharge start to reach V_2 (s).



1-2 ESR_{AC}

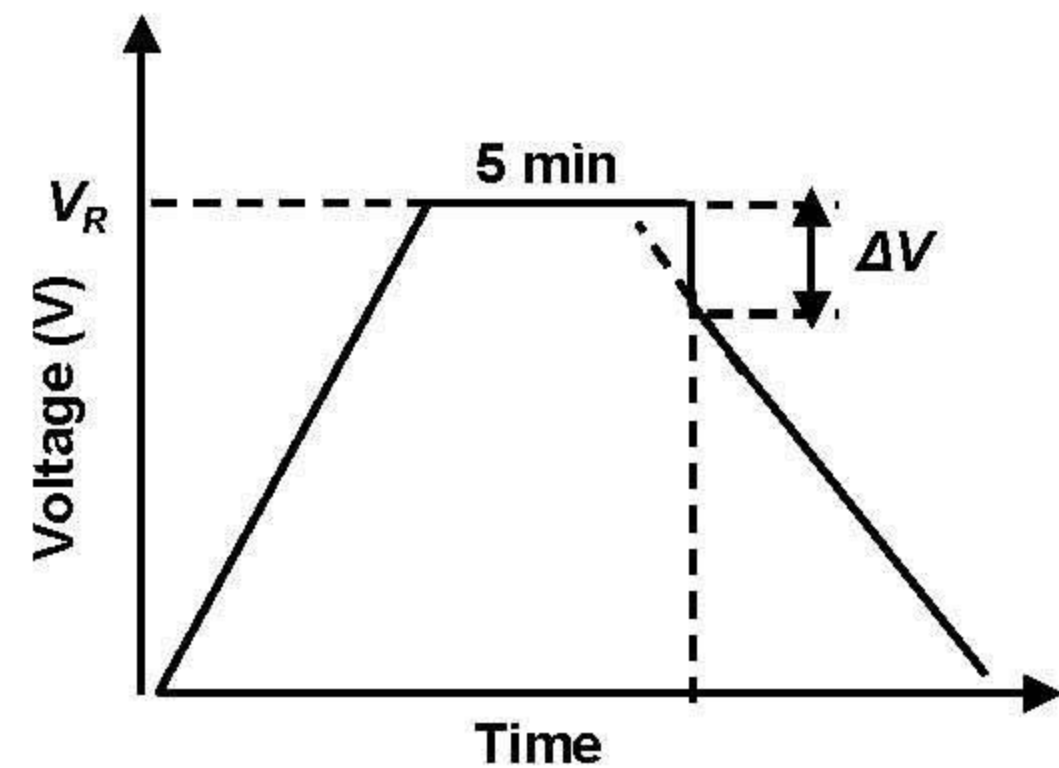
- 1) ESR_{AC} is measured by 4-probe impedance analyzer at the following conditions.
 - Condition : Potentiostat mode
 - AC Amplitude : 5mV
 - Frequency : 1kHz, 100Hz

1-3 ESR_{DC}

- 1) Constant current charge to V_R
- 2) Constant voltage charge at V_R for 5min
- 3) Constant current discharge to 0.1V

$$R_d = \frac{\Delta V}{I}$$

- Where R_d is the ESR_{DC} (Ω);
 ΔV is the voltage drop for 10ms (V);
 I is the discharge current (A).



1-4 Leakage Current

- 1) The capacitor is charged to the rated voltage at 25 °C.
- 2) Leakage current is measured after 72 hours by current measurement equipment.

* Life time is provisional value

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2. Technical Information

1) Definition of Max Current

- Current for 1sec discharge from the rated voltage to the half of it in constant current discharge,

$$I_{MAX} (A) = \frac{1/2 V_R}{\Delta t / C + R_d}$$

Where Δt is the discharge time (sec), 1 sec in this case ;

C is the capacitance (F);

R_d is the ESR_{DC} (Ω);

V_R is the rated voltage (V).

2) Definition of Max Stored Energy

$$E_{MAX} (Wh) = \frac{1/2 C V_R^2}{3600}$$

$$\text{Gravimetric Specific Energy (Wh / kg)} = \frac{E_{MAX}}{\text{Weight}}$$

※ Life time is provisional value

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