

5. Gold Capacitors Characteristics data

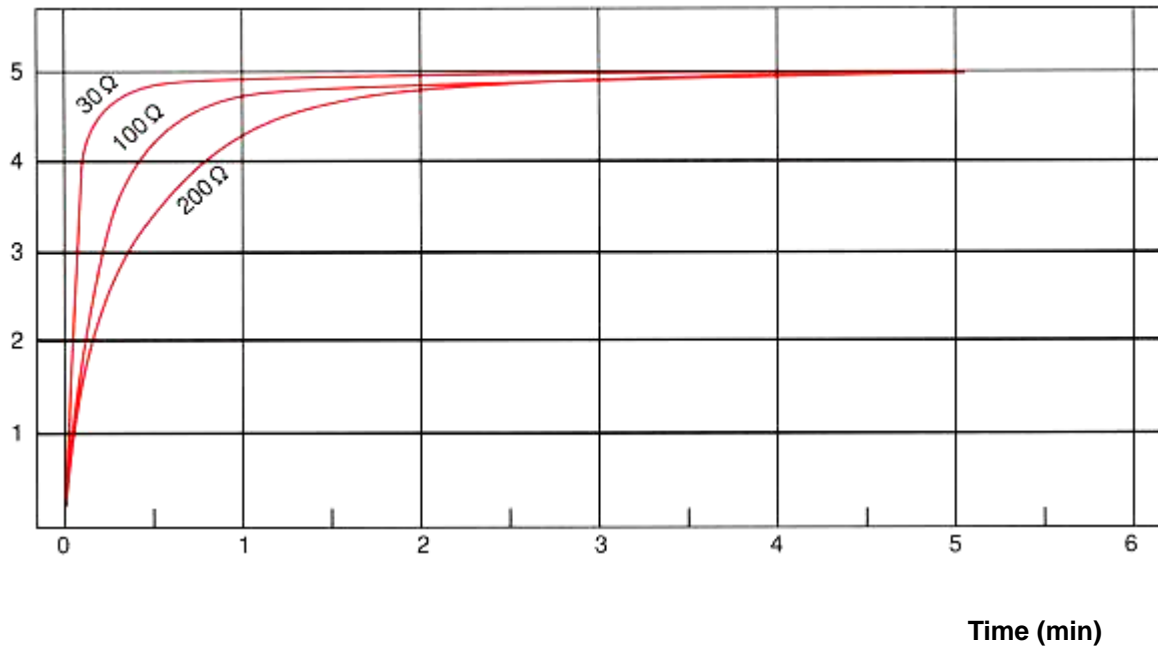
- Charging characteristics
- Self-discharging characteristics according to charging time
- Influence of ambient temperature on self-discharging characteristics
- Discharge characteristics
- Influence of ambient temperature on discharging characteristics
- Current characteristics
- Relations between discharge current and capacitance change
- Relations between applied voltage and capacitance change
- Relations between ambient temperature and capacitance change
- Reliability and temperature characteristics data

This data is typical data. It does not guarantee Life time.

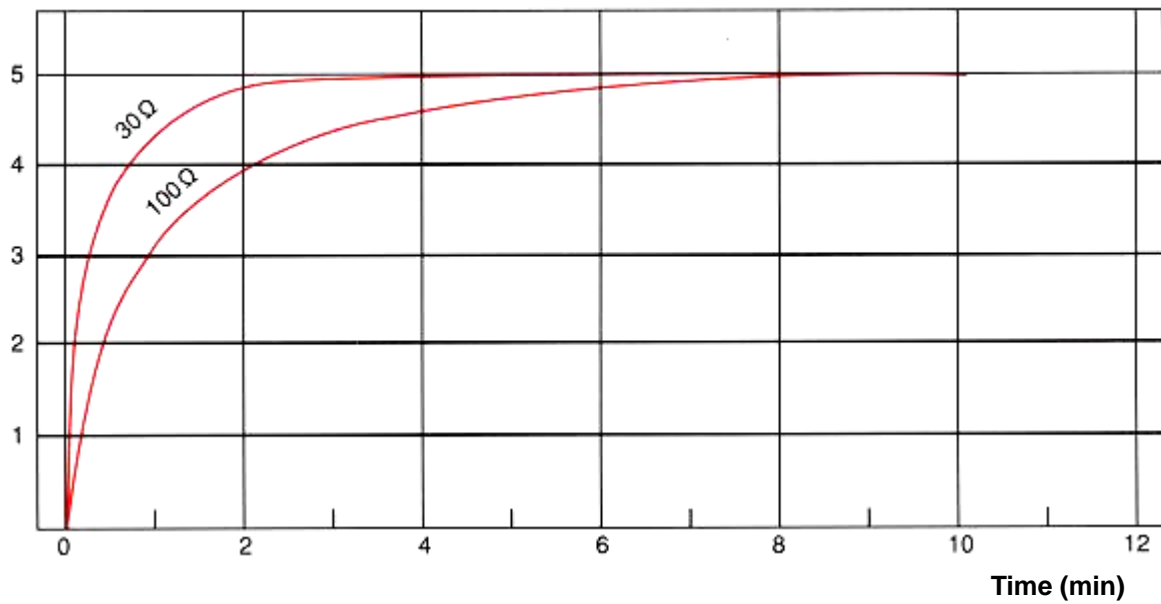
Before using the products, carefully check the effects on their quality and performance.

Charging characteristics

Part number: EECS0HD104V (5.5V 0.1F) at +20°C

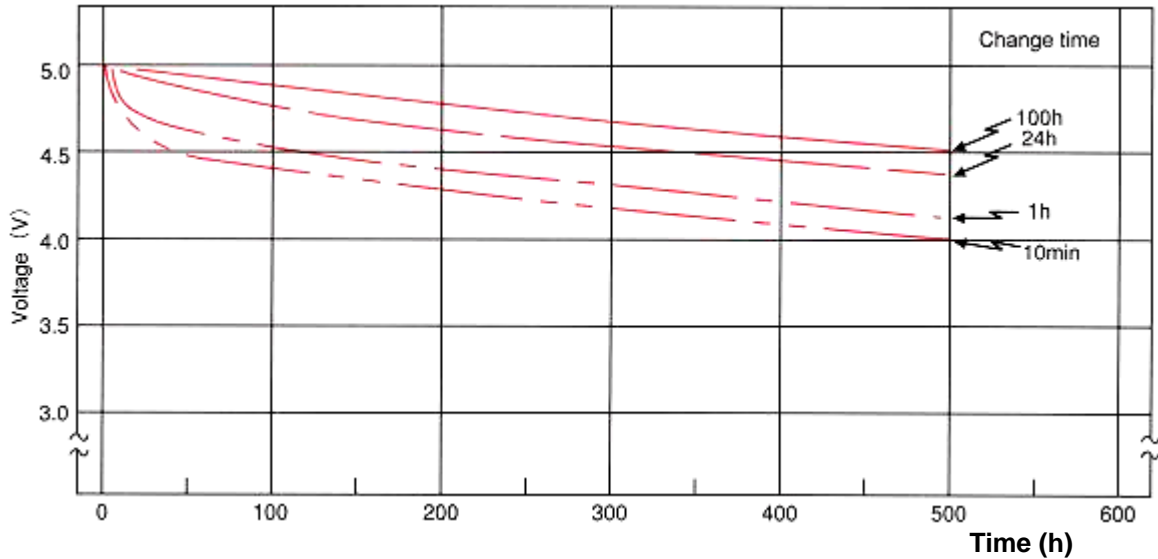


Part number: EECF5R5U105 (5.5V 1.0F) at +20°C



Self-discharging characteristics according to charging time

Part number: EECF5R5U105 (5.5V 1.0F) Charge voltage: 5V

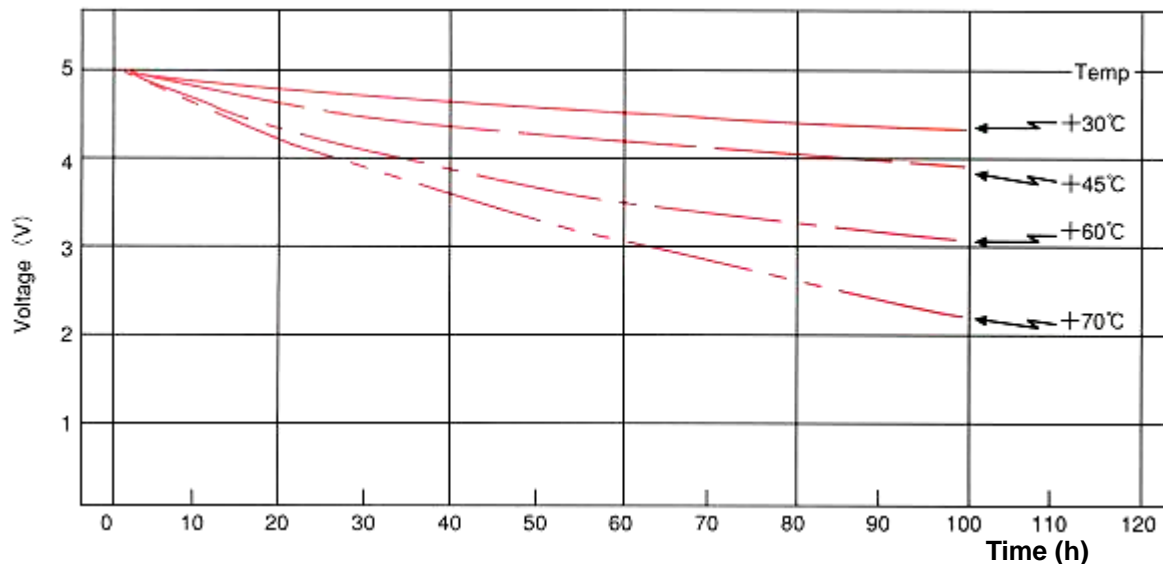


(Note) If charging time is brief, complete charge is not attained, and initial voltage due to internal charge is increased.

Influence of ambient temperature on self-discharging characteristics

Charging condition: 5V, 24hours

Part number: EECS0HD104V (5.5V 0.1F)



(Note) In the self-discharge characteristics, the terminal voltage drop is affected by ambient temperature. This means a self-discharge current becomes great as ambient temperature rises. In case where it is used with a micro applied current of nano-ampere order, ambient temperature allows a difference to occur in back-up time.

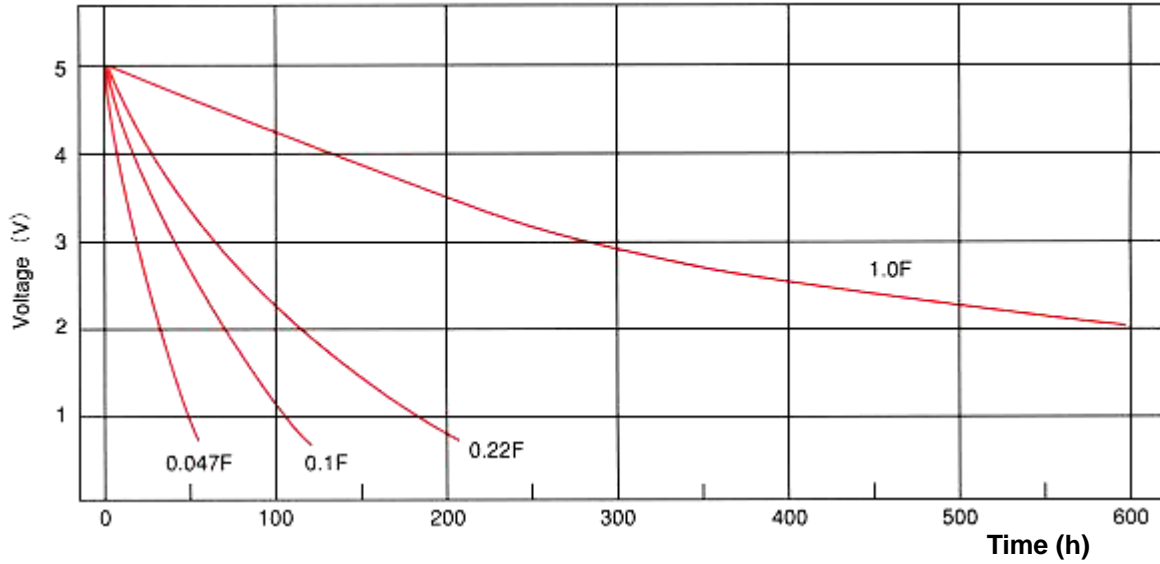
Discharging characteristics

Constant resistance discharge: $1M\Omega$

Charge voltage: 5V

Charge time: 24hours

Measurement temp: $+20^{\circ}C$



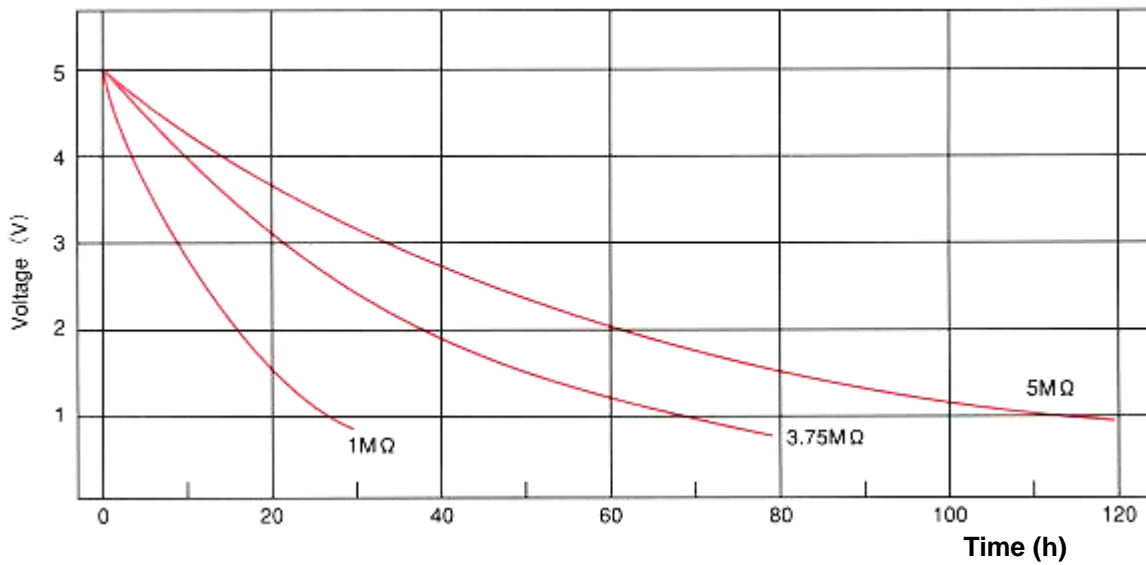
Constant resistance discharge

Charge voltage: 5V

Charge time: 24hours

Part number: EECSoHD473V (5.5V0.047F)

Measurement temp: $+20^{\circ}C$

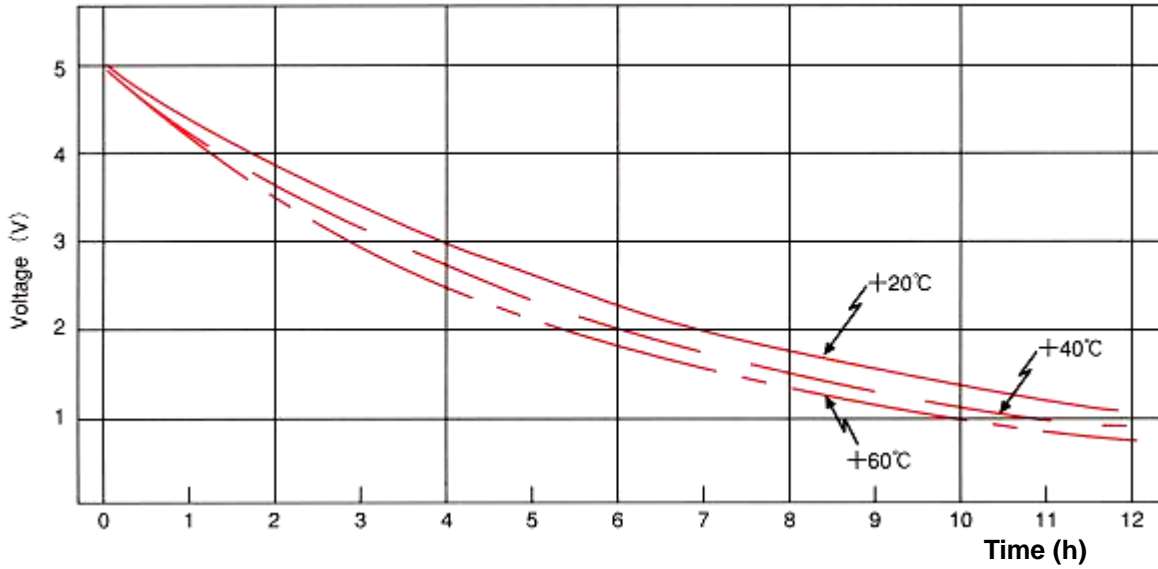


Influence of ambient temperature on discharge characteristics

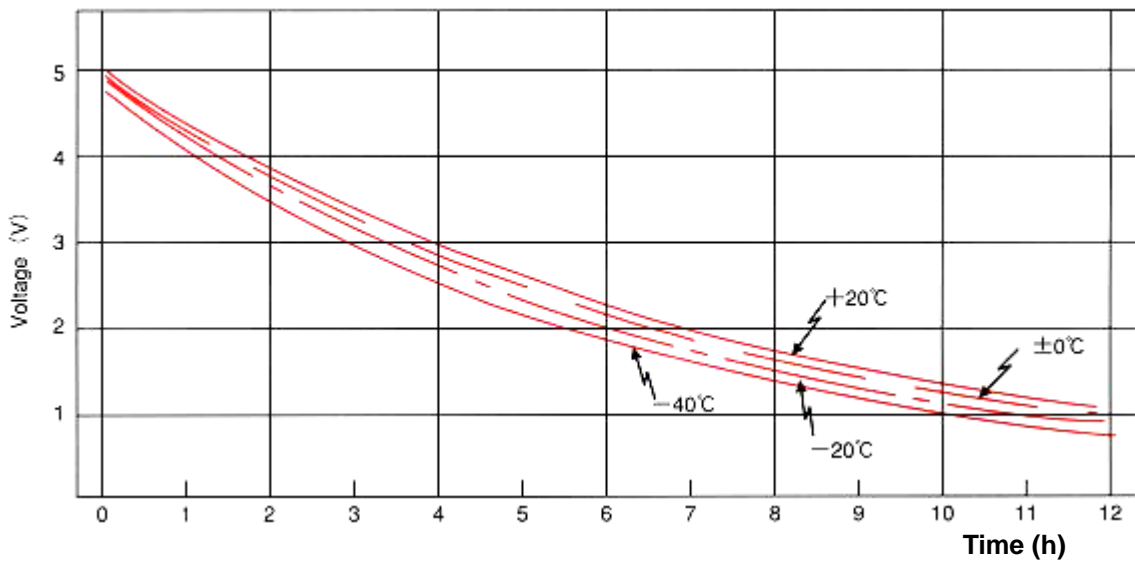
Constant resistance discharge: 250kΩ

Charge time: 24hours

Part number: EECF5R5U104 (5.5V0.1F)



(Note) Voltage drop gets a little faster as ambient temperature rise. This occurs because the rise in ambient temperature causes a self-discharge current added to applied current.



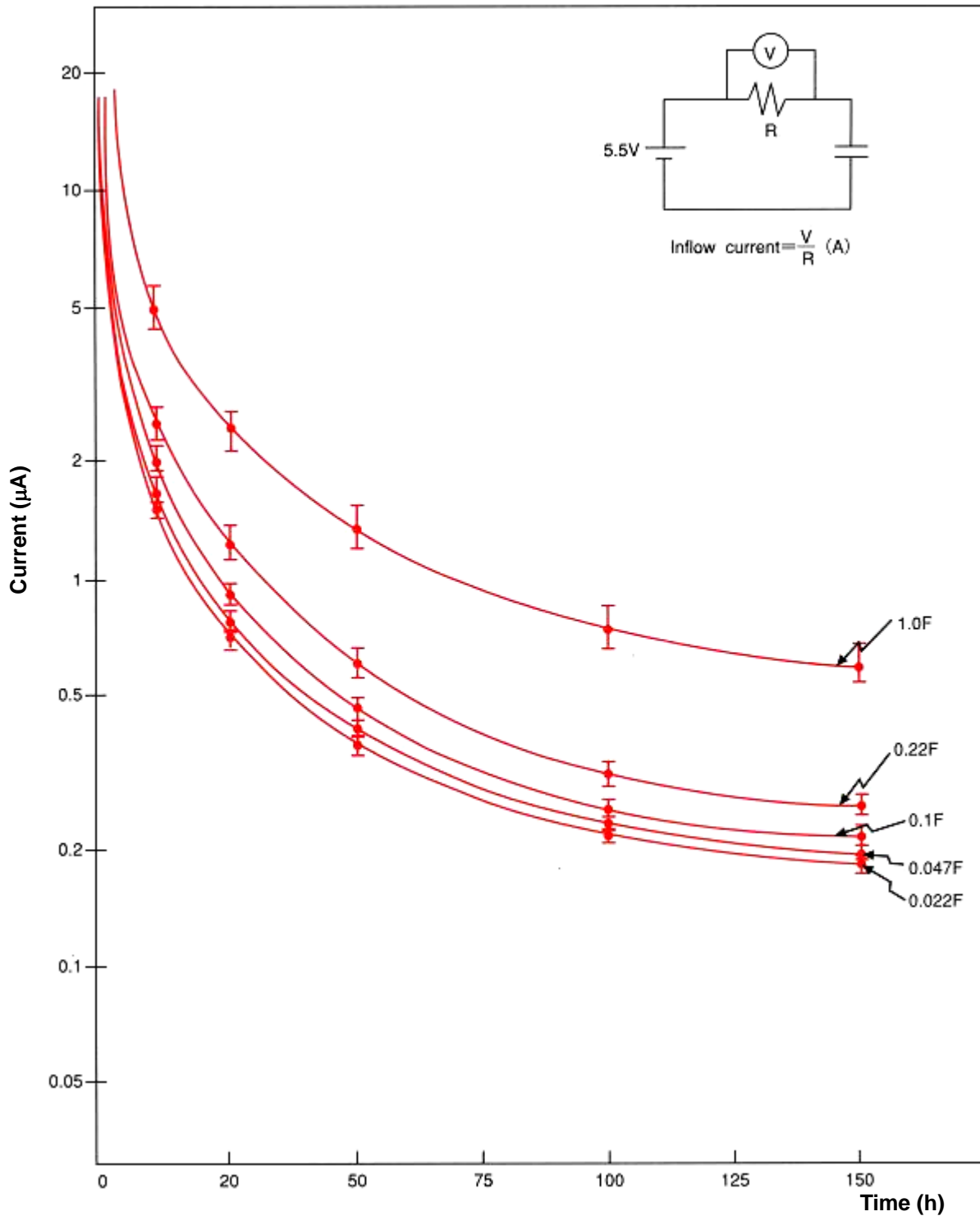
(Note) In low temperature area, ion movement for the formation of electric double layers becomes slow, and time required for complete charge takes longer. Consequently, The voltage drop is large in the condition with low temperature when there is no difference at charging time..

Current characteristics

Initialization of test samples

The samples shall be measured after applying 5.5V for 2hours 300Ω resistance in the temperature (20±10°C, 65±10% not being wetted with dew) and discharging in short circuit for 12 to 24hours.

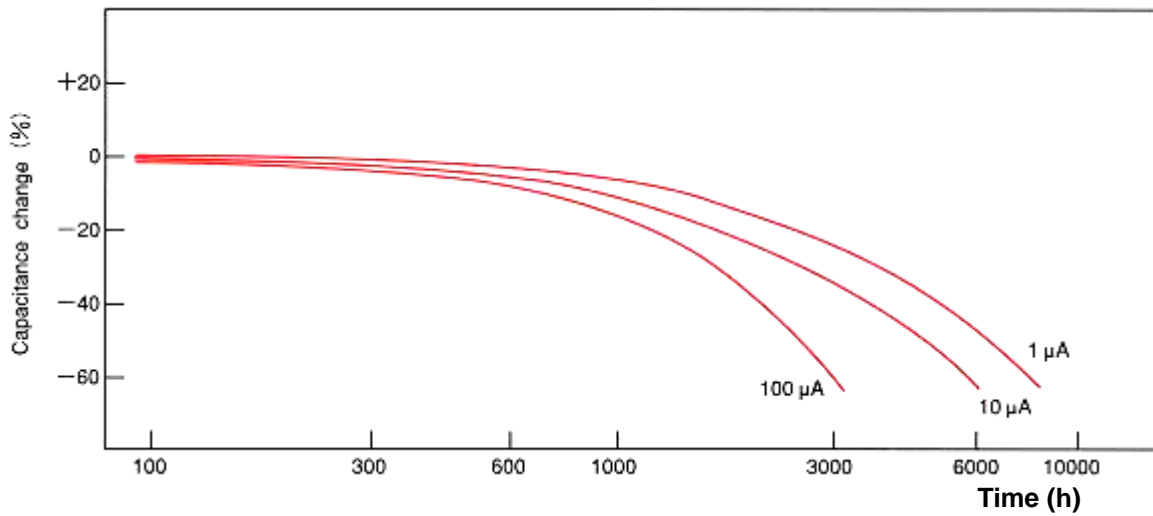
Series NF (n =20)



Relations between discharge current and capacitance change

Part number: EECF5R5U104 (5.5V0.1F)

Test condition: +70°C 5.5V



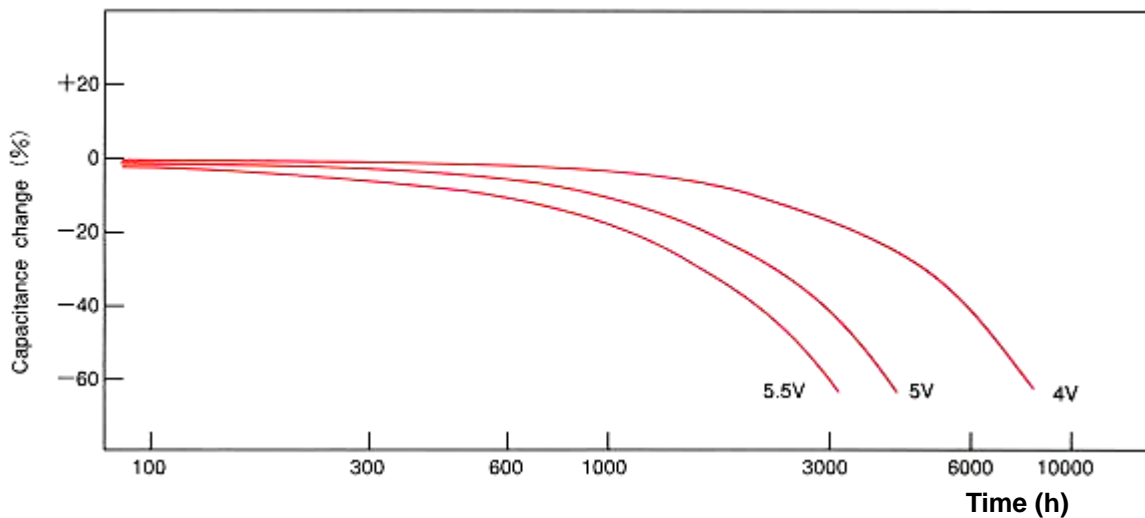
(Note) Capacitance changes at the life test vary from applied current (measuring current). The longer the utility life, the less the applied current

Relations between applied voltage and capacitance change

Part number: EECF5R5U104 (5.5V0.1F)

Test condition: +70°C 5.5V

Applied voltage: 4, 5, 5.5V



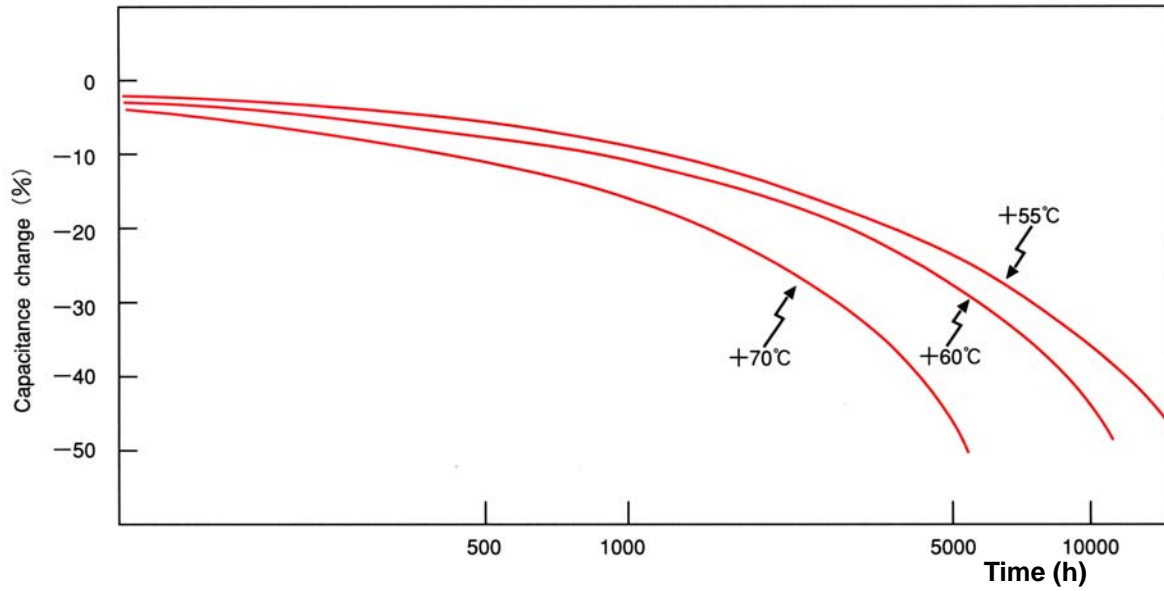
(Note) Capacitance changes at the life test vary from applied voltage. The lower the voltage is, the smaller it becomes. Almost no capacitance change due to no-load shelving.

Relations between ambient temperature and capacitance change

Part number: EECF5R5U104 (5.5V0.1F)

Test condition: +70, +60, +55°C

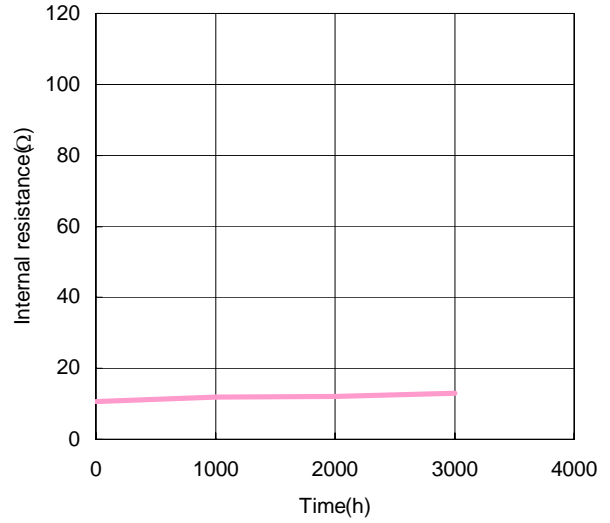
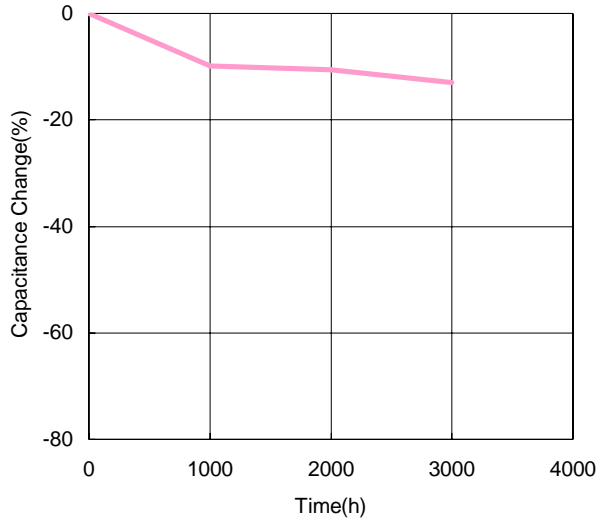
Applied voltage: 5.5V



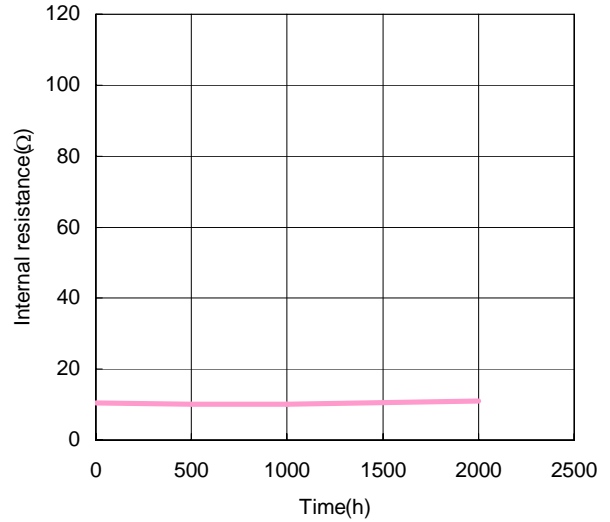
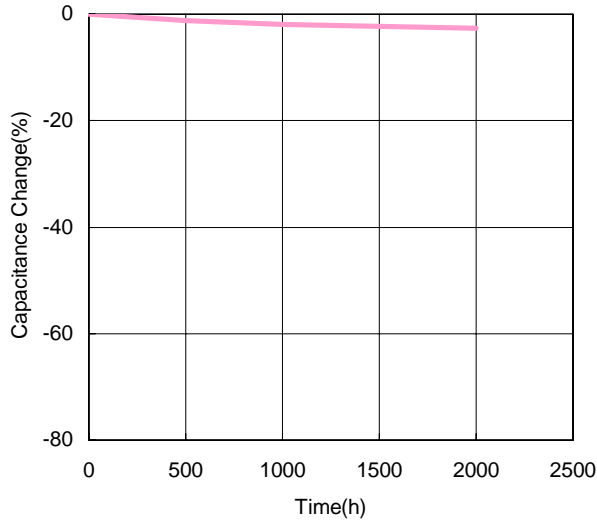
Reliability and temperature characteristics data

Part number: EECRF0H684 (5.5V, 0.68F)

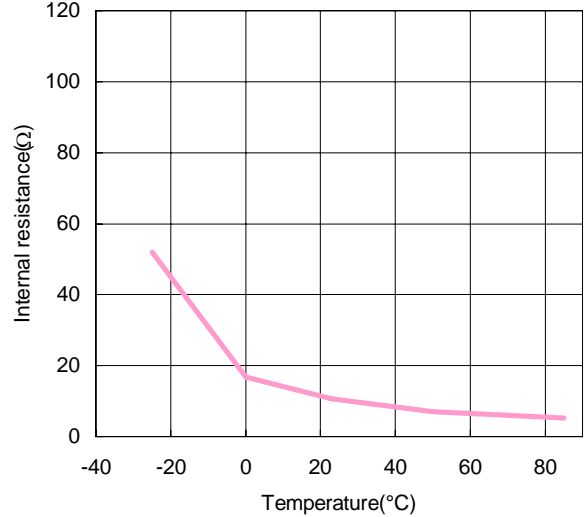
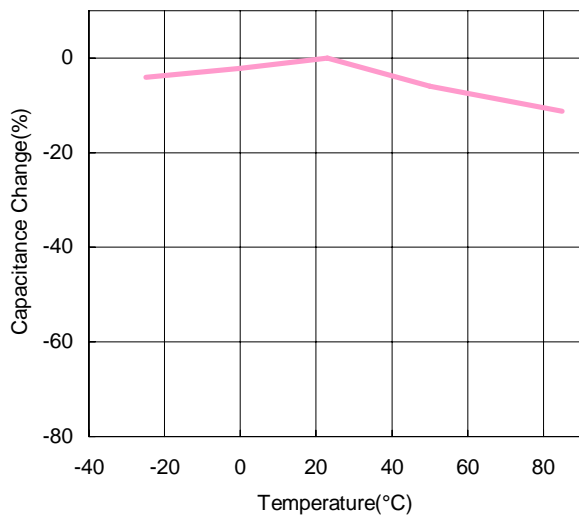
Endurance (at 85°C, 5.5V applied)



Shelf life (at 85°C)



Temperature characteristics

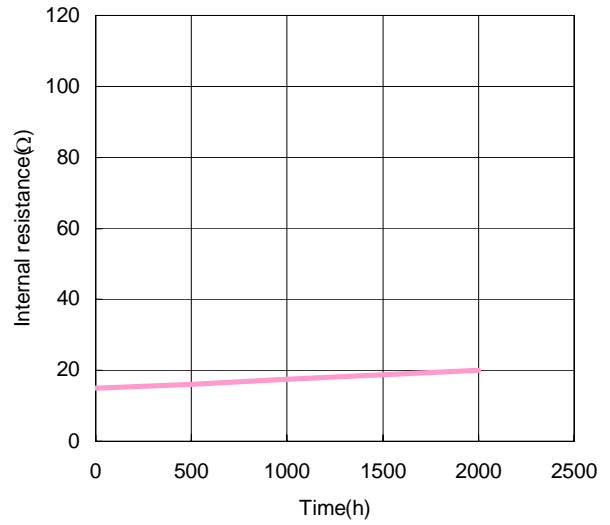
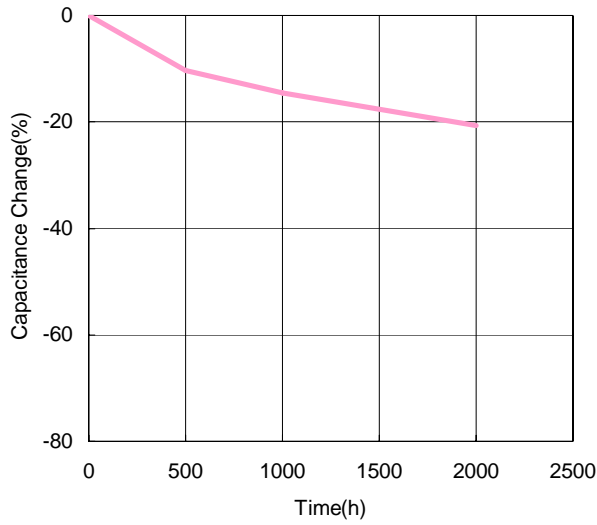


(The discharge current shall be calculated by the capacitance value in a ratio of 1mA/F)

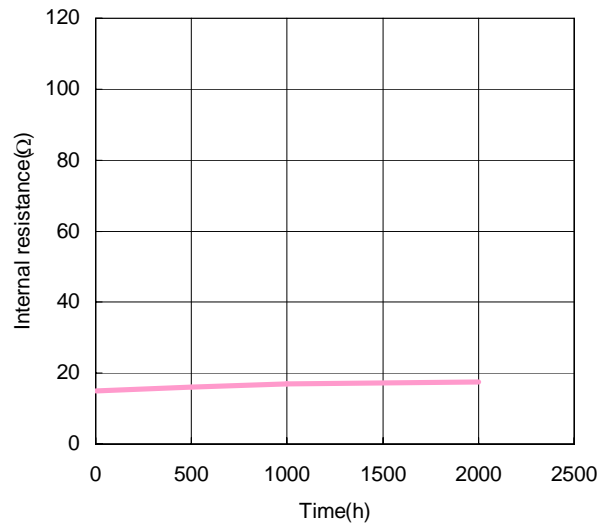
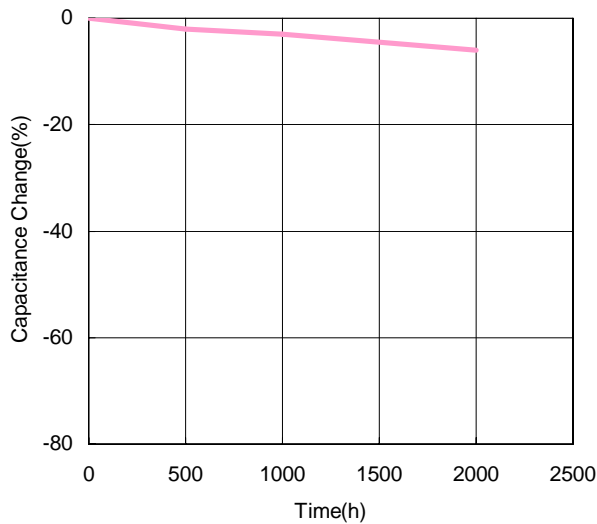
Reliability and temperature characteristics data

Part number: EECF5R5H105 (5.5V, 1.0F)

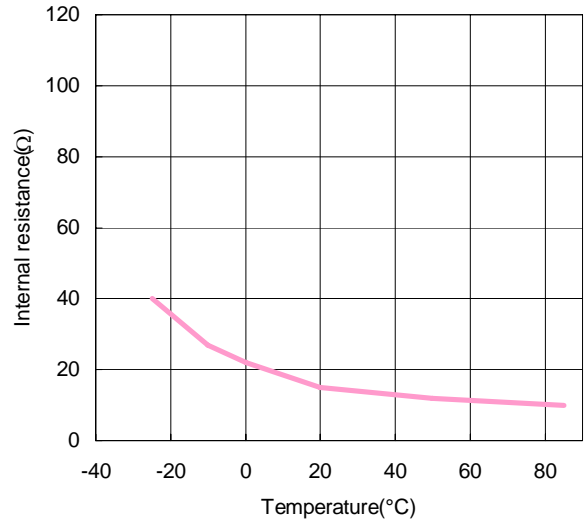
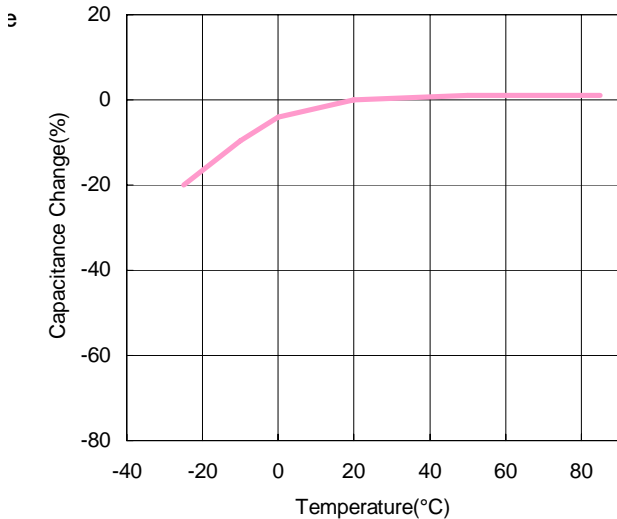
Endurance (at 85°C, 5.5V applied)



Shelf life (at 85°C)



Temperature characteristics

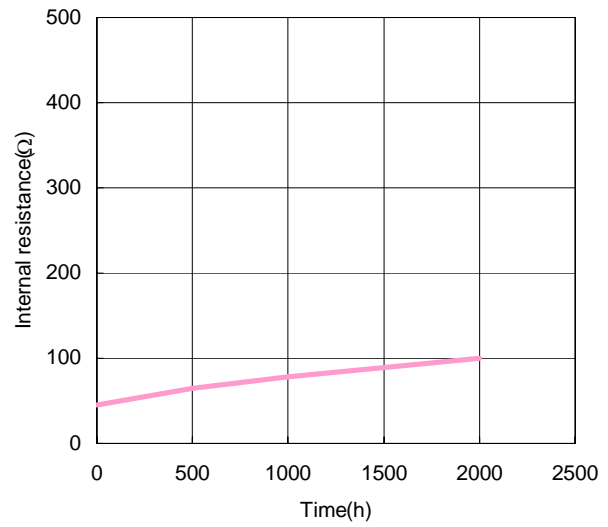
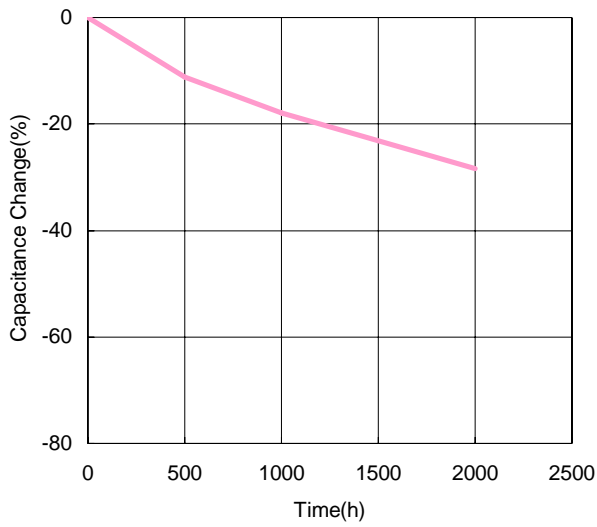


(The discharge current shall be calculated by the capacitance value in a ratio of 1mA/F)

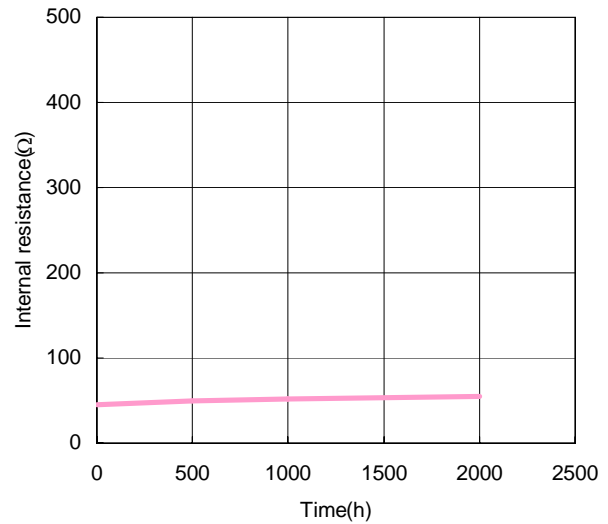
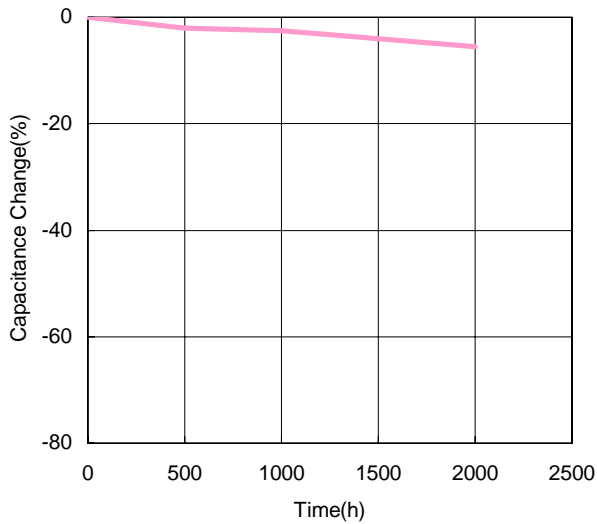
Reliability and temperature characteristics data

Part number: EECF5R5H104(5.5V, 0.1F)

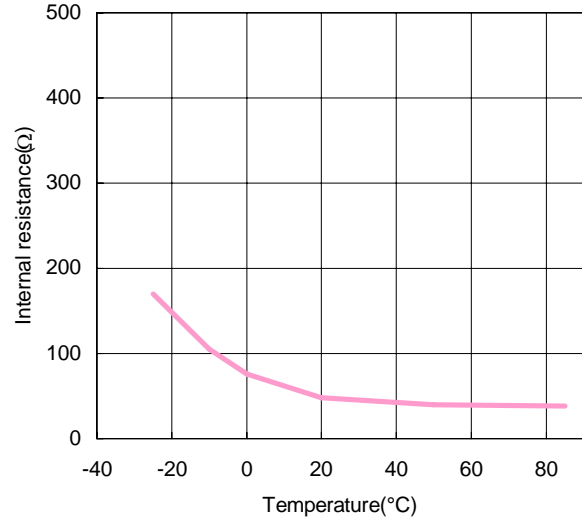
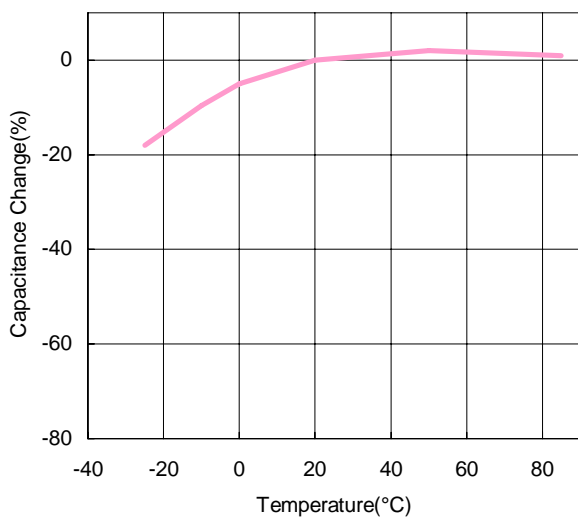
Endurance (at 85°C, 5.5V applied)



Shelf life (at 85°C)



Temperature characteristics

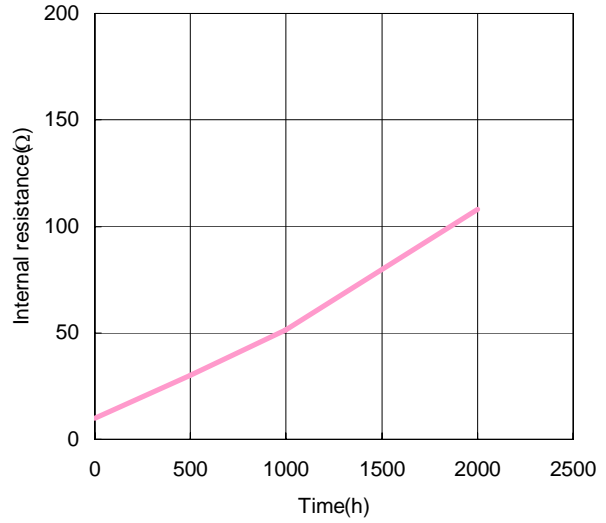
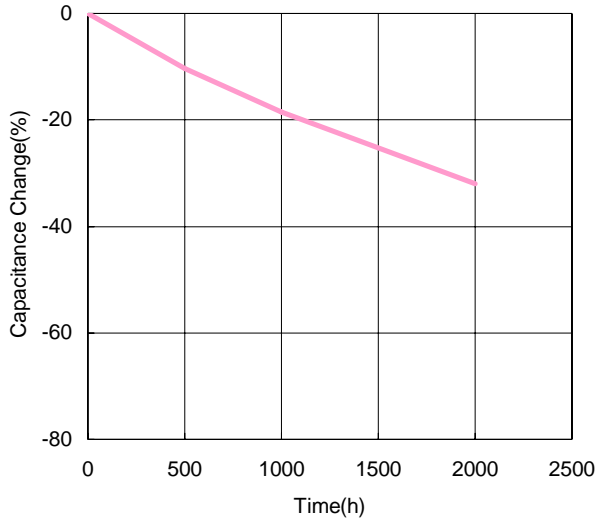


(The discharge current shall be calculated by the capacitance value in a ratio of 1mA/F)

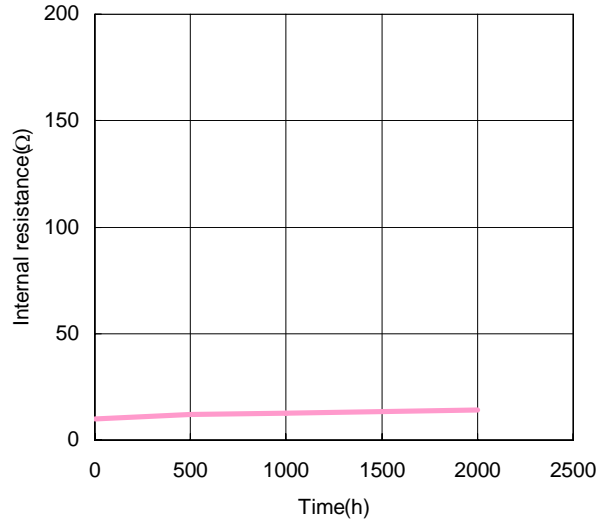
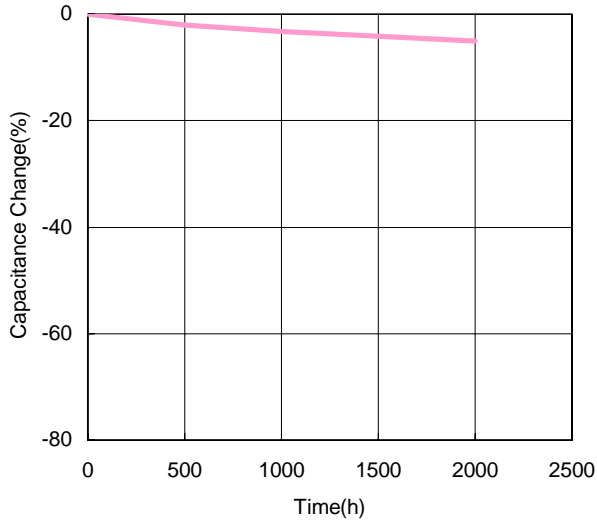
Reliability and temperature characteristics data

Part number: EECS5R5V155(5.5V, 1.5F)

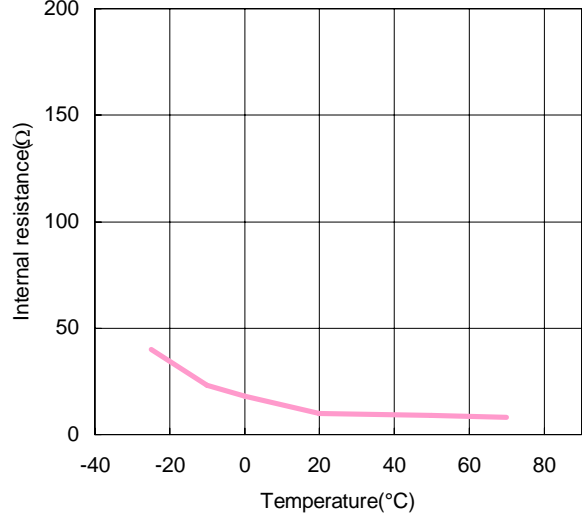
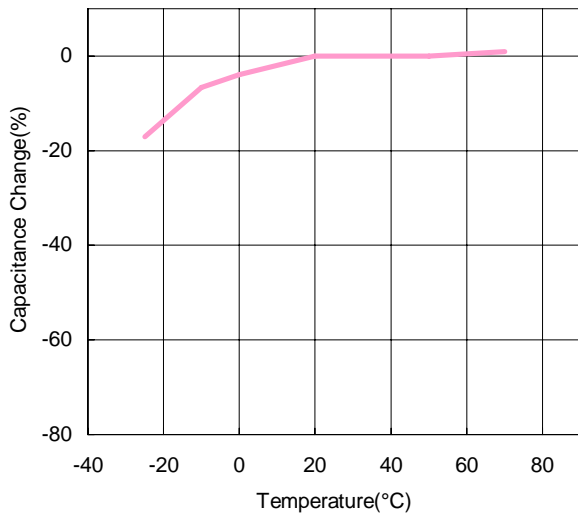
Endurance (at 70°C, 5.5V applied)



Shelf life (at 70°C)



Temperature characteristics

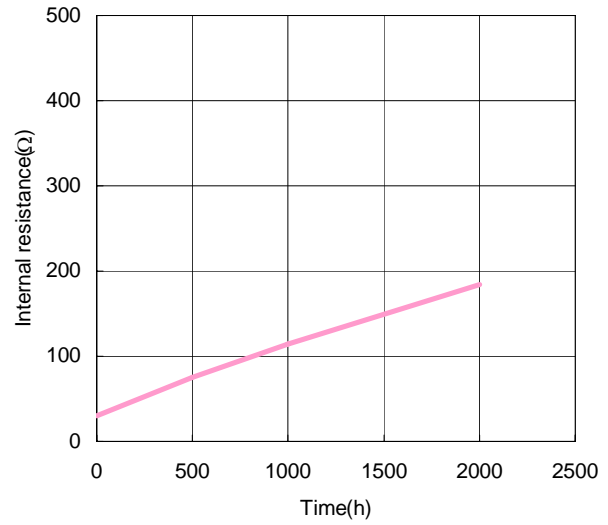
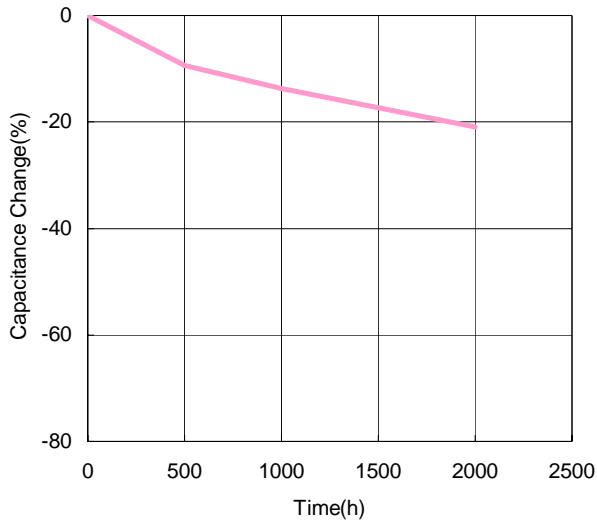


(The discharge current shall be calculated by the capacitance value in a ratio of 1mA/F)

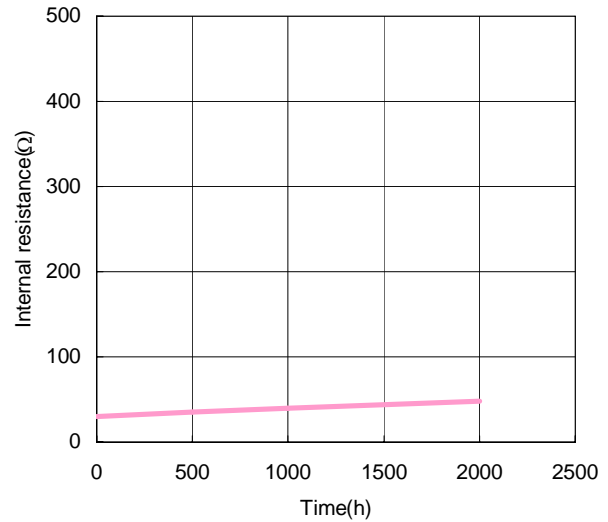
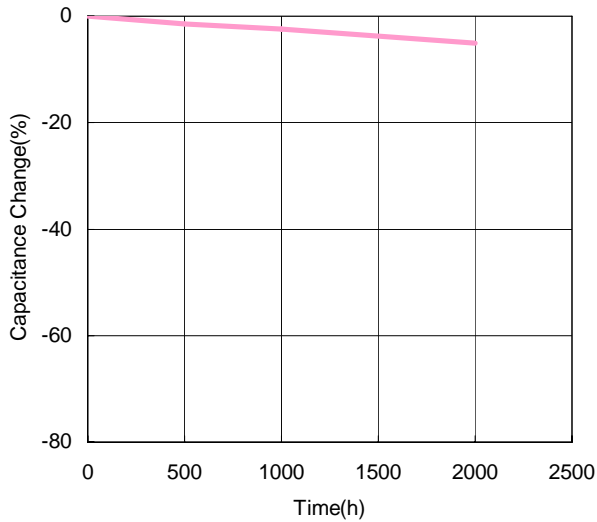
Reliability and temperature characteristics data

Part number: EECS0HD224V(5.5V, 0.22F)

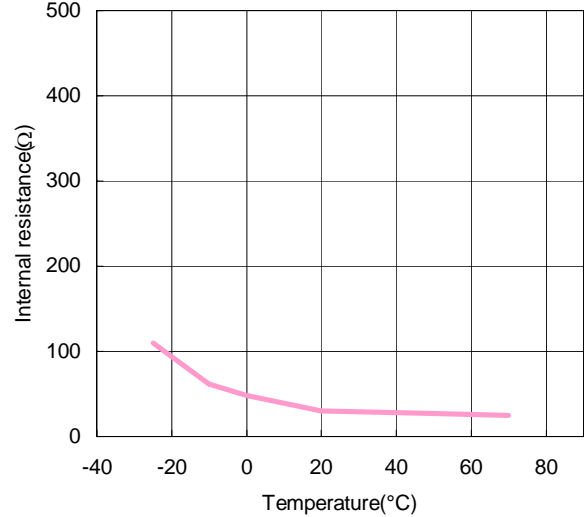
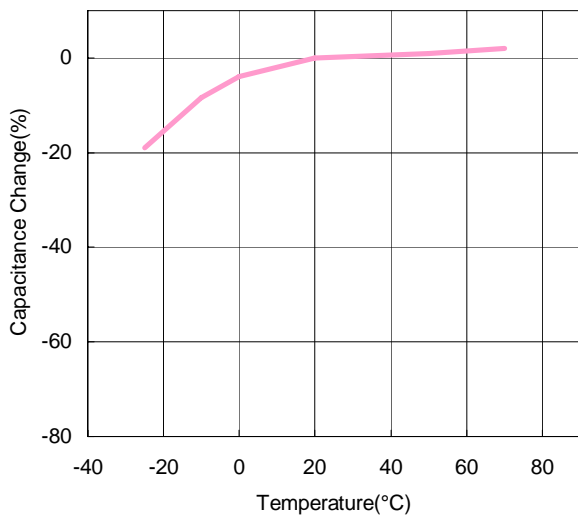
Endurance (at 70°C, 5.5V applied)



Shelf life (at 70°C)



Temperature characteristics

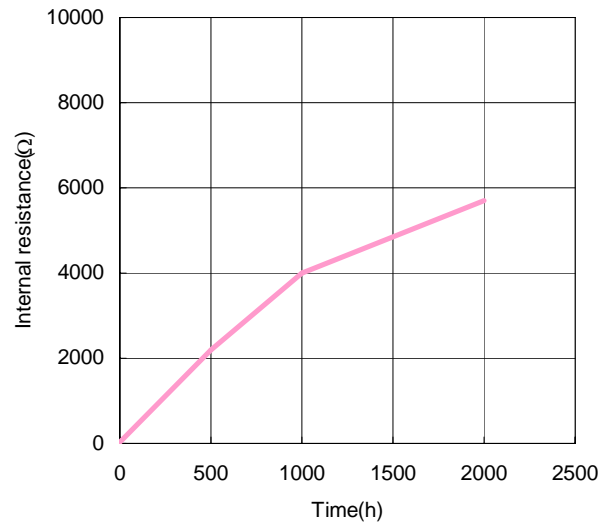
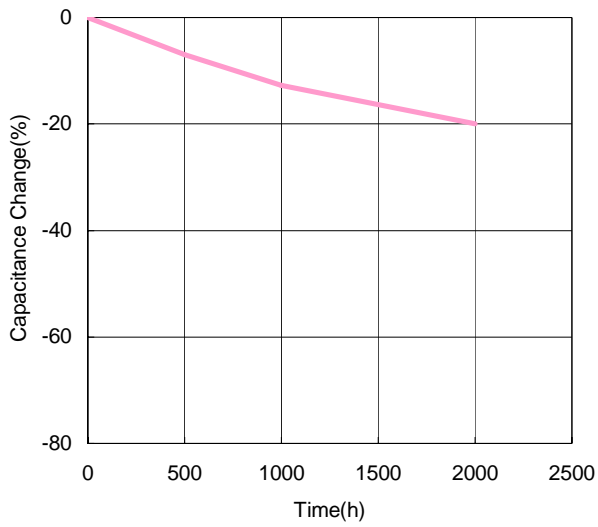


(The discharge current shall be calculated by the capacitance value in a ratio of 1mA/F)

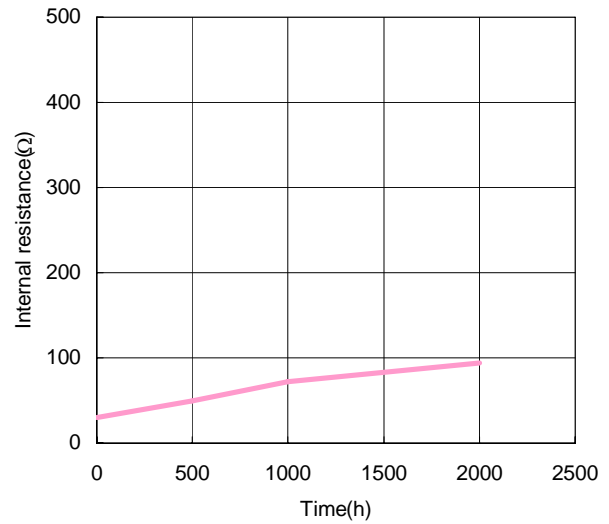
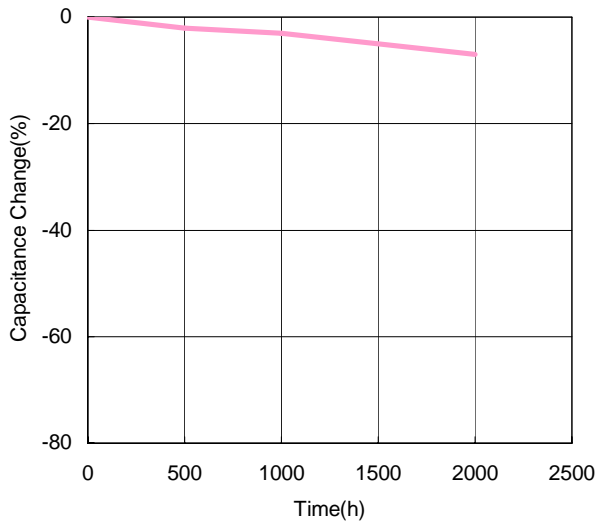
Reliability and temperature characteristics data

Part number: EECEN0F204AK(3.3V, 0.2F)

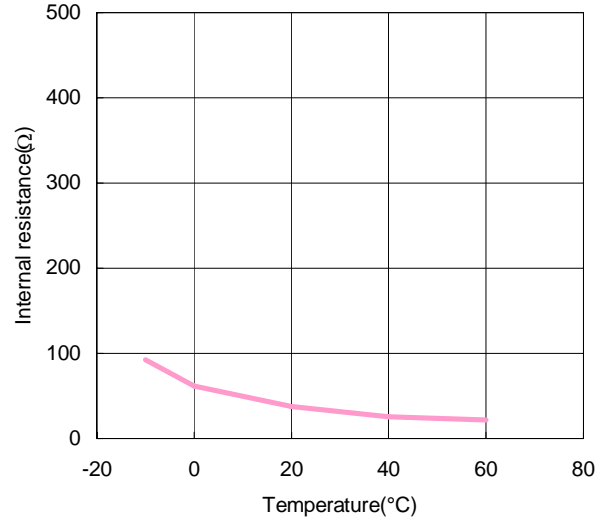
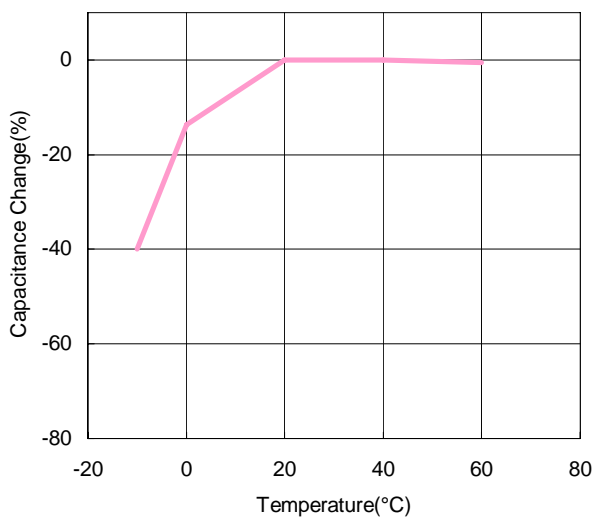
Endurance (at 60°C, 3.3V applied)



Shelf life (at 60°C)



Temperature characteristics

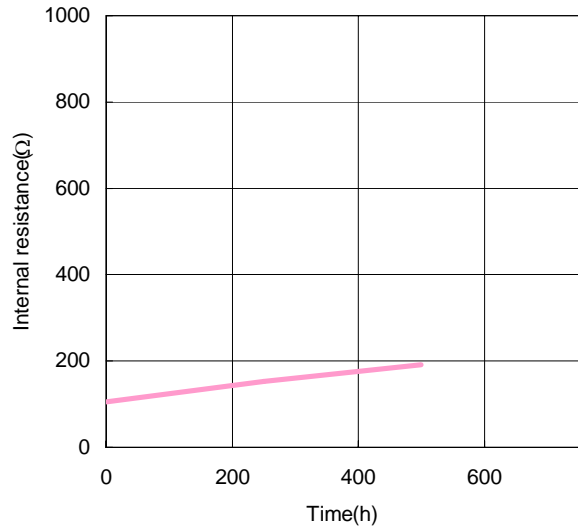
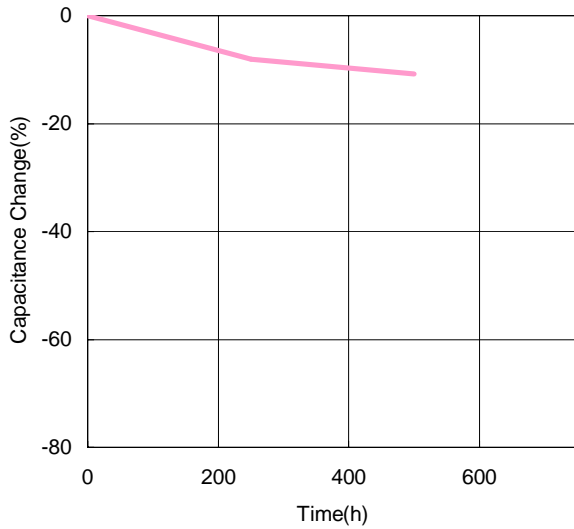


(The discharge current shall be calculated by the capacitance value in a ratio of 10μA)

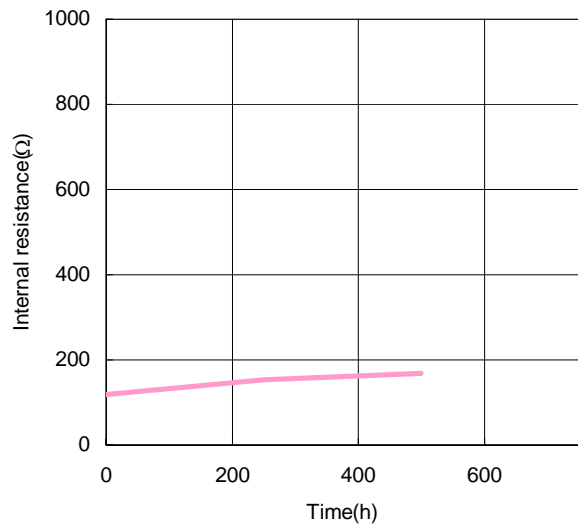
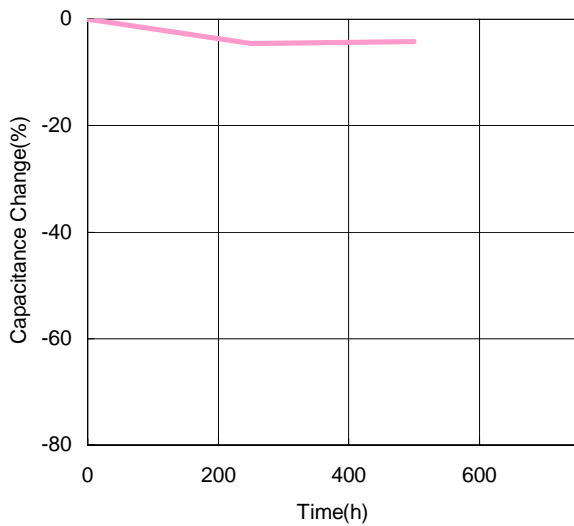
Reliability and temperature characteristics data

Part number: EEEP0E333A(2.6V, 0.033F)

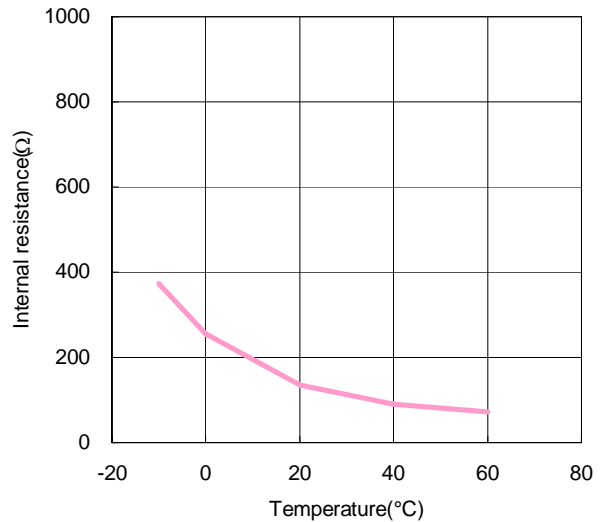
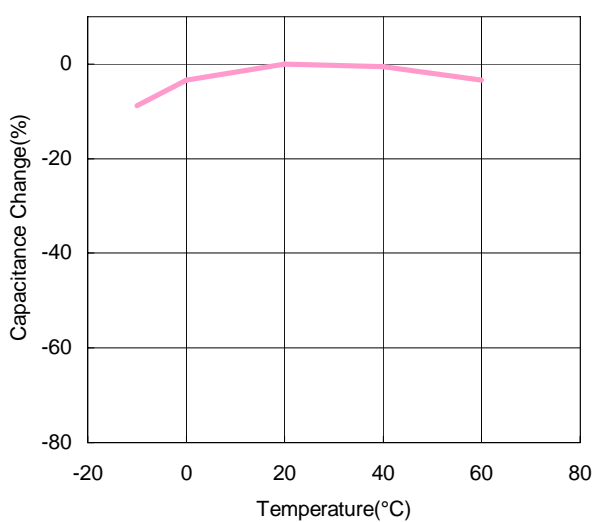
Endurance (at 60°C, 2.6V applied)



Shelf life (at 60°C)



Temperature characteristics

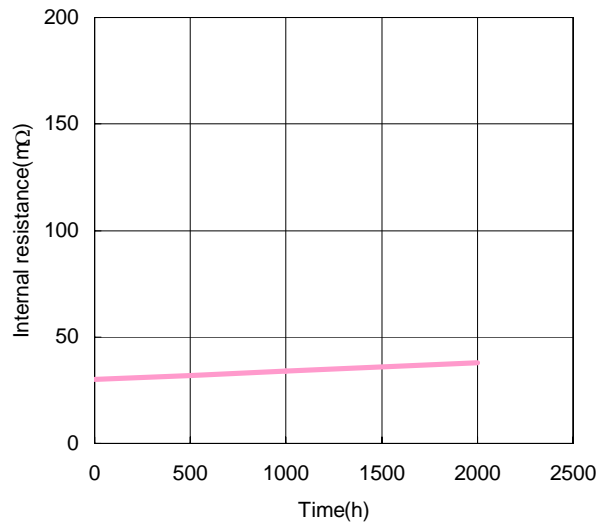
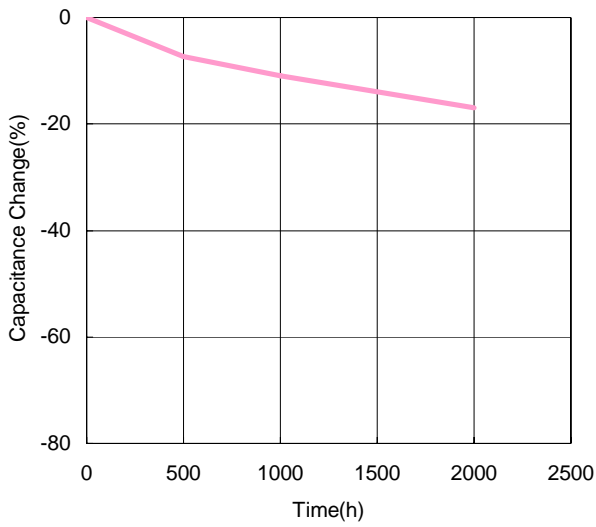


(The discharge current shall be calculated by the capacitance value in a ratio of 0.005mA)

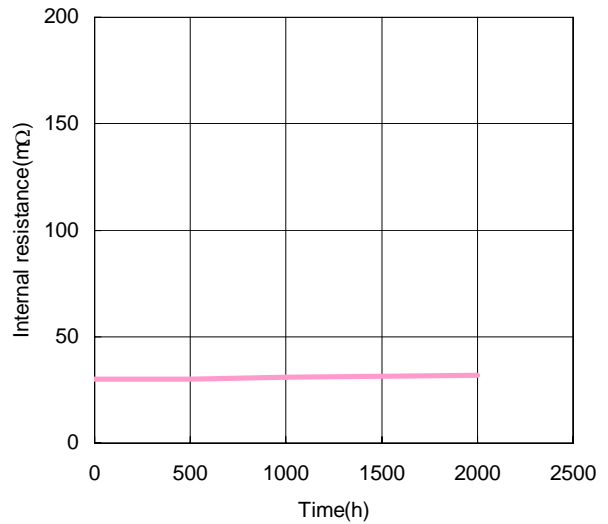
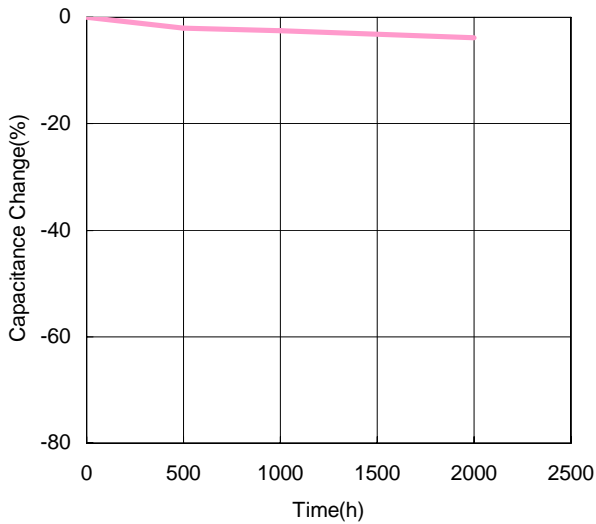
Reliability and temperature characteristics data

Part number: EECHW0D506(2.3V, 50F)

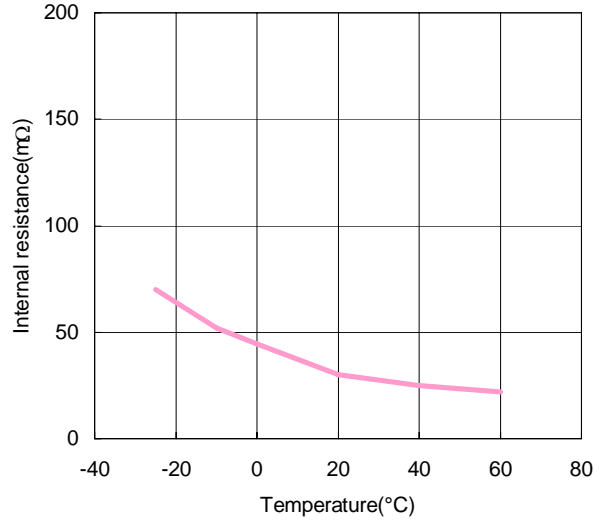
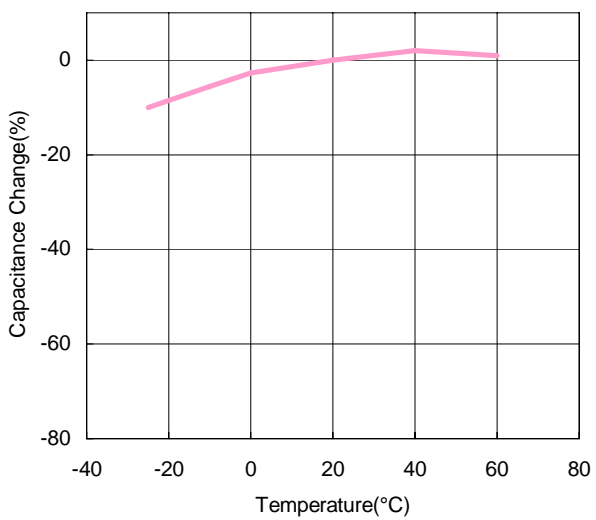
Endurance (at 60°C, 2.3V applied)



Shelf life (at 60°C)



Temperature characteristics

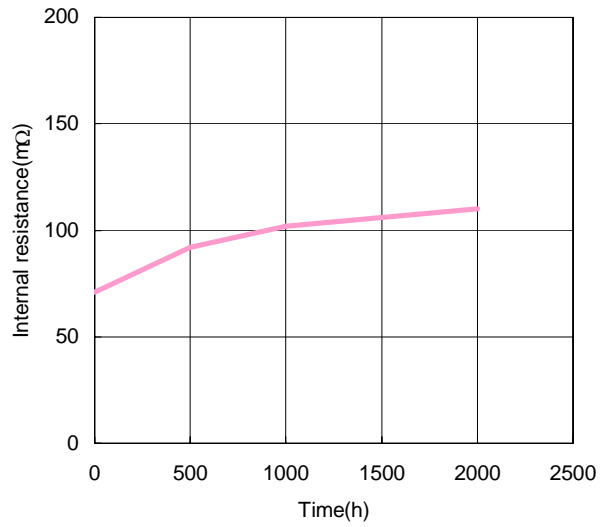
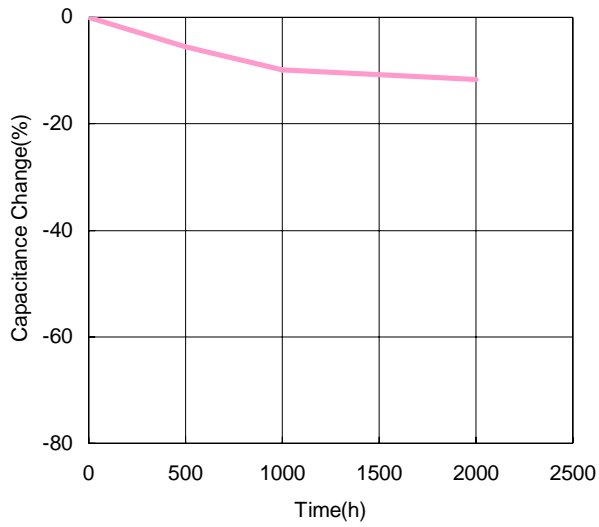


(The discharge current shall be calculated by the capacitance value in a ratio of 1mA/F)

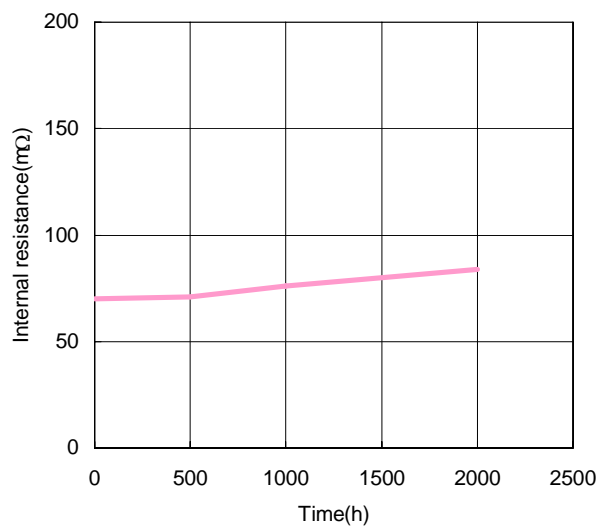
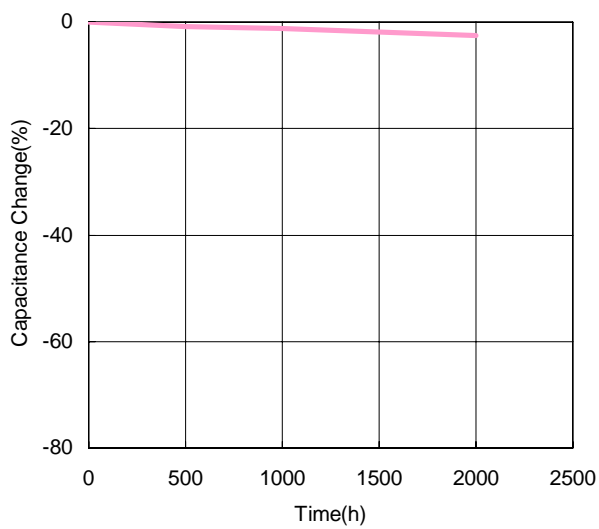
Reliability and temperature characteristics data

Part number: EECHZ0E106(2.5V, 10F)

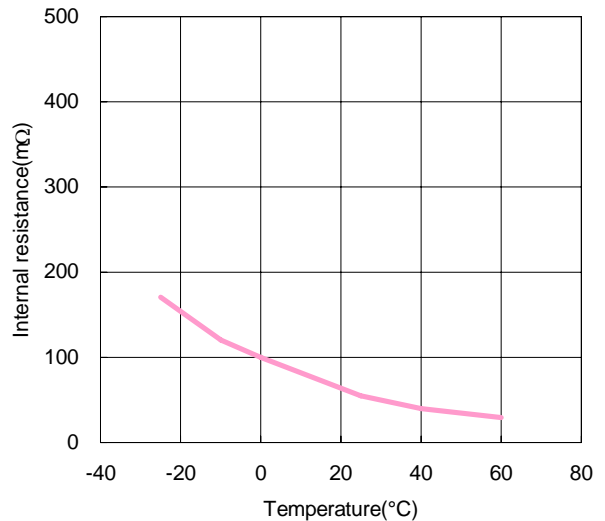
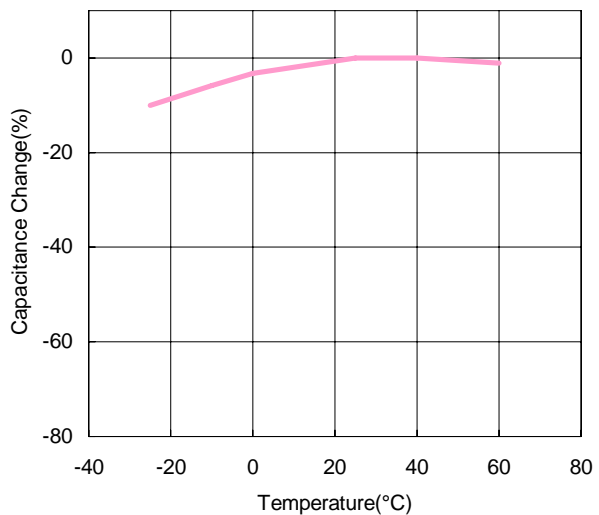
Endurance (at 60°C, 2.5V applied)



Shelf life (at 60°C)



Temperature characteristics



(The discharge current shall be calculated by the capacitance value in a ratio of 1mA/F)