

Stacked coin Type

Series: **NF**

Country of Origin

■ **Feature**

Endurance : 70°C 1000 h

Japan



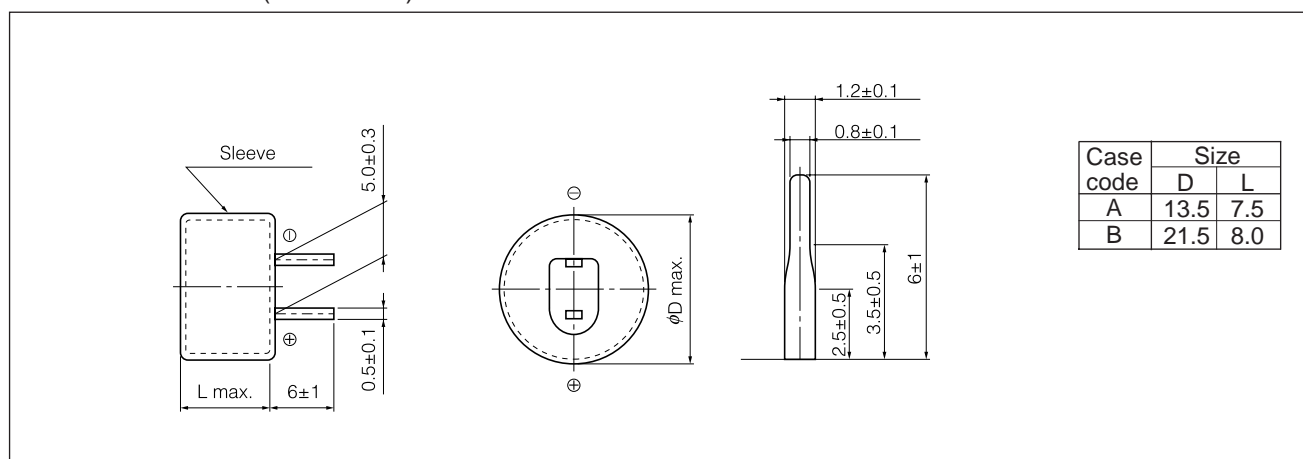
■ **Recommended Applications**

Memory back-up for Video, Audio, Camera, Telephones, Printer, Date terminal, Rice cooker and intelligent remote controller

■ **Specifications**

Category temp. range	-25 to +70°C	
Maximum Operating Voltage	5.5 V .DC	
Nominal Cap. Range	0.1 to 1.5 F	
Characteristics at Low Temperature	Capacitance change	±30% of initial measured value at +20°C (-25 to +70°C)
	Internal resistance	≤ 5 times of initial measured value at +20°C (at -25°C)
Endurance	After 1000 hours application of 5.5V. DC at +70°C, the capacitor shall meet the following limits.	
	Capacitance change	±30% of initial measured value
	Internal resistance	≤ 4 time of initial specified value
Shelf Life	After 1000 hours storage at +70°C without load, the capacitor shall meet the specified limits for Endurance.	
Moisture Resistance	After 500 hours storage at +55°C, 90 to 95% R.H., the capacitor shall meet the specified limits for "Endurance".	

■ **Dimensions in mm (not to scale)**



■ **Standard products**

Maximum Operating Voltage (V.DC)	Capacitance (F)	Capacitance range (F)	internal resistance (Ω) at 1kHz	Case code	Part number	Min. Packaging QTY.	
						Quantity per box (pcs)	Quantity per outer packaging (pcs)
5.5	0.10	0.08 to 0.18	≤ 75	A	EECF5R5U104	200	2000
	0.22	0.176 to 0.396	≤ 75	A	EECF5R5U224	200	2000
	0.47	0.376 to 1.410	≤ 30	B	EECF5R5U474	100	500
	1.0	0.80 to 1.80	≤ 30	B	EECF5R5U105	100	500
	1.5	1.20 to 2.70	≤ 30	B	EECF5R5U155	100	500

Note:It is not allowed to go through reflow (IR,Atmosphere heating methods etc.) process.

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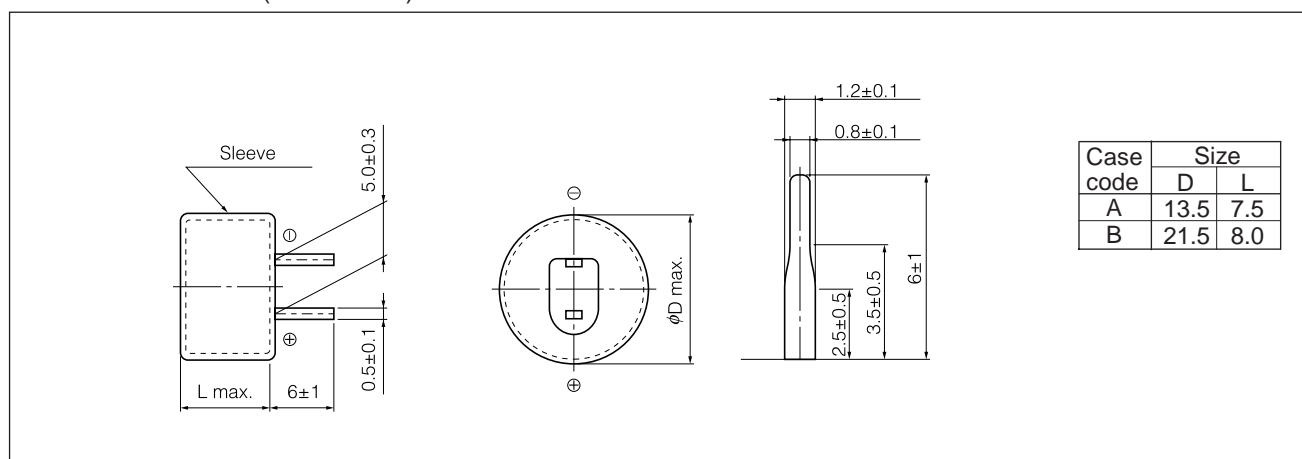
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Gold Capacitor

NF Type

NF Type Gold Capacitor provides super large capacitance by unique electrode and miniaturization technology meeting the trend of compactness. NF Type is suitable for a memory back-up for C MOS type RAM in microcomputers.



Features

- Line-up of 0.033 farad to 1.0 farad capacitance values at 5.5 volts to meet the requirements of extremely low current flow memory back-up applications.
- A long period memory back-up is available by excellent self-discharging characteristics.
- NF Type low profile design is 7.5 mm maximum ($\phi 13.5$) and 8.0mm maximum ($\phi 21.5$) in height and has a standardized 5mm terminal spacing.
- Superior to primary or secondary batteries in operating temperature range, charge/discharge characteristics, long time reliability and performance stability.

Specifications

- Operating temperature range: $-25^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- Rated working voltage: 5.5 V DC
- Surge voltage: 6.3 V DC
- Rated capacitance: 0.033~1.0F
- Capacitance tolerance: $-20 \sim +80\%$
- Leakage current:
The capacitor shall be applied 5.5 V for 30 minutes at 20°C . (Refer to standard products table for each value)
- Internal resistance:
Impedance shall be specified at 1 kHz/ 20°C . (Refer to standard products table for each value)

• Temperature characteristics:

Capacitance change	Within $\pm 30\%$ of the measured value at 20°C
Internal resistance at -25°C	Less than 5 times of the value at 20°C
Leakage current at 70°C	Less than 4 times of the value at 20°C

• Load life characteristics:

The capacitor shall meet the following specification after 1,000 hours with the rated voltage applied at 70°C .

Capacitance change	Within $\pm 30\%$ of the initial measured value
Internal resistance	Less than 4 times of the initial specified value
Leakage current	Less than 2 times of the initial specified value

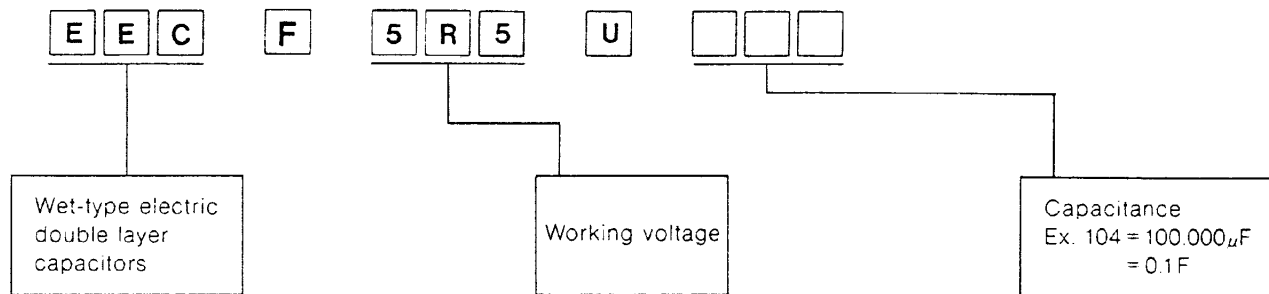
• Shelf life characteristics:

The capacitor shall meet the same specification as "Load life characteristics" after 500 hours exposure at 70°C with no voltage applied.

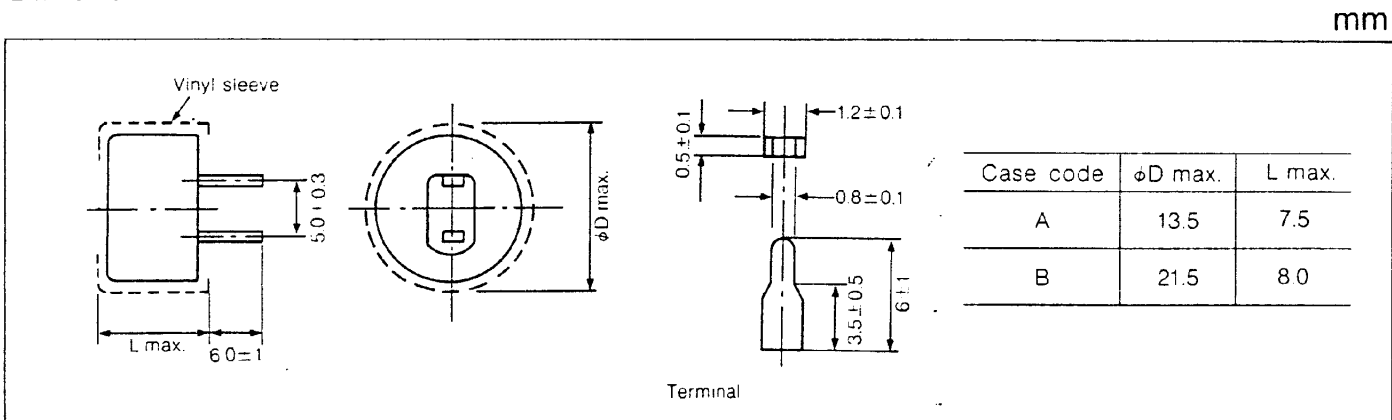
• Humidity characteristics:

The capacitor shall meet the same specification as "Load life characteristics" after 500 hours charge of the rated working voltage at $50^{\circ}\text{C}/90 \sim 95\%$ R.H.

Part number system



Dimensions



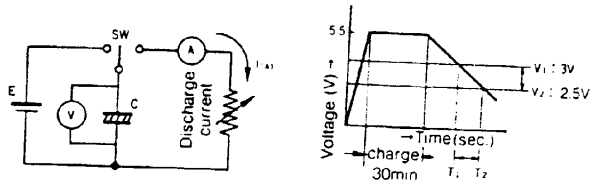
Standard products table

W.V. (V.DC)	Capacitance (F)	Part Number	Capacitance Range (F)	Leakage current* (μ A/30min)	Internal resistance (Ω /1 kHz)	Case code
5.5	0.033	EECF5R5U333	0.0264~0.0594	57	150	A
	0.047	EECF5R5U473	0.0376~0.0846	69	120	A
	0.1	EECF5R5U104	0.08 ~0.18	100	75	A
	0.33	EECF5R5U334	0.264 ~0.594	182	40	B
	0.47	EECF5R5U474	0.376 ~0.846	216	30	B
	1.0	EECF5R5U105	0.8 ~1.8	315	30	B

* Leakage current shown in table is measured after 30 minutes charge of rated working voltage. In the practical application circuit, it decreases to several μ A level after 10 hours.

Measuring of characteristics

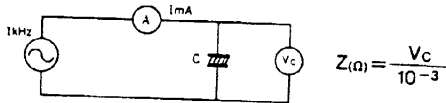
1) Capacitance



$$C(F) = \frac{I(A) \times (T_2 - T_1) \text{ (sec.)}}{V_1 - V_2(V)}$$

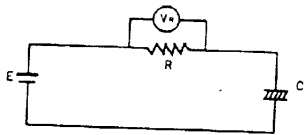
The discharge current shall be calculated by the capacitance value in a ratio of 1mA/fand.

2) Internal resistance (Impedance at 1 kHz)



$$Z(\Omega) = \frac{V_c}{10^{-3}}$$

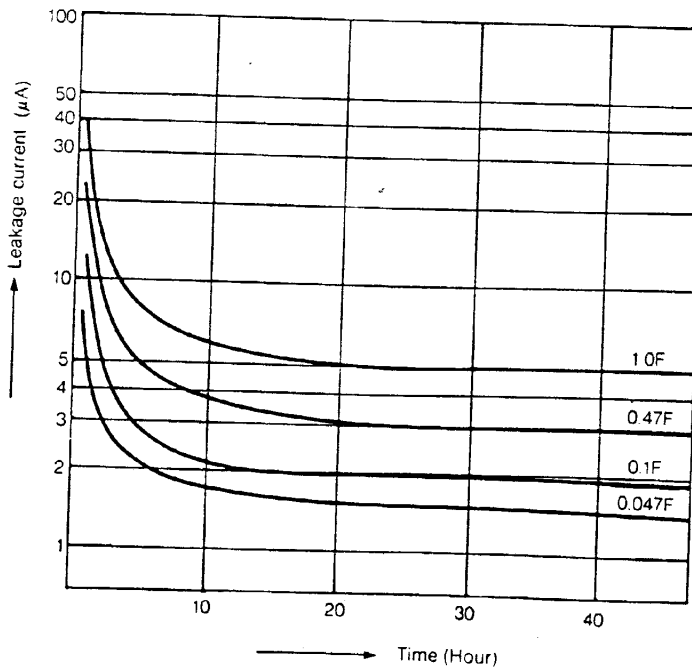
3) Leakage current



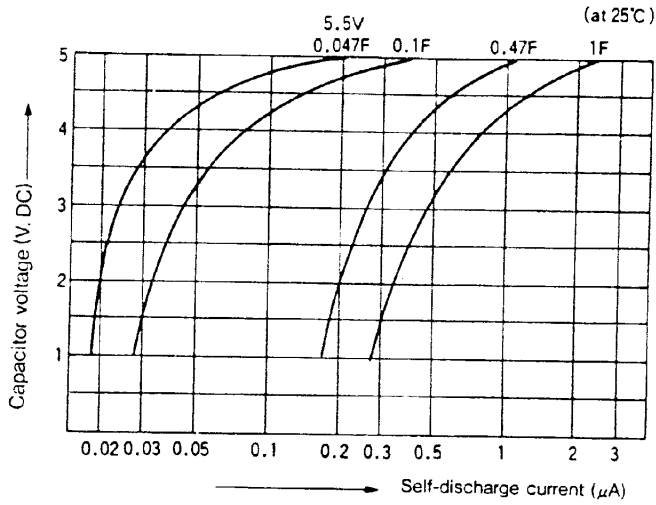
$$LC(A) = \frac{V_R}{R}$$

Leakage current shall be measured after 30 minutes with the rated working voltage applied to the capacitor.

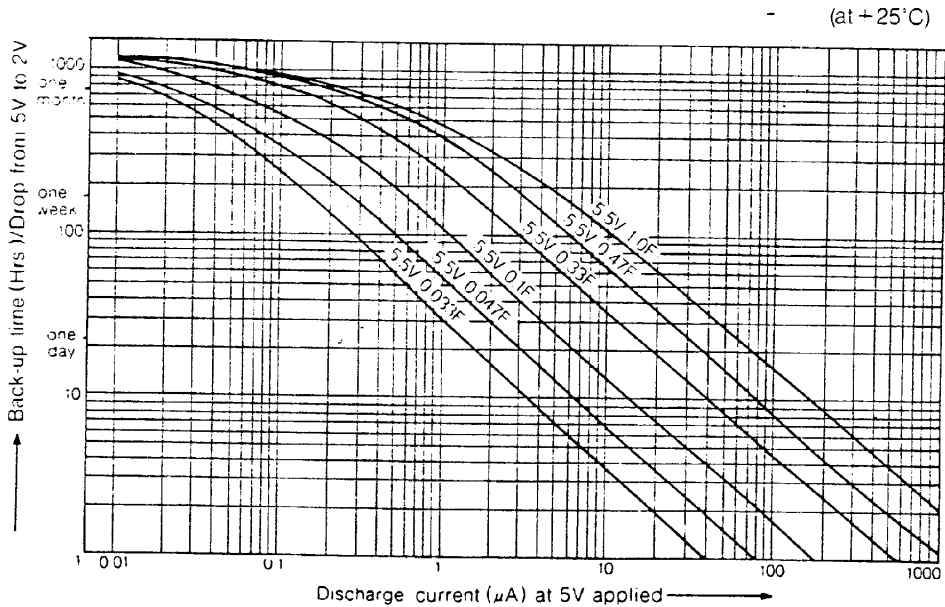
Leakage current change (at + 25°C)



Capacitor voltage vs. self-discharge current

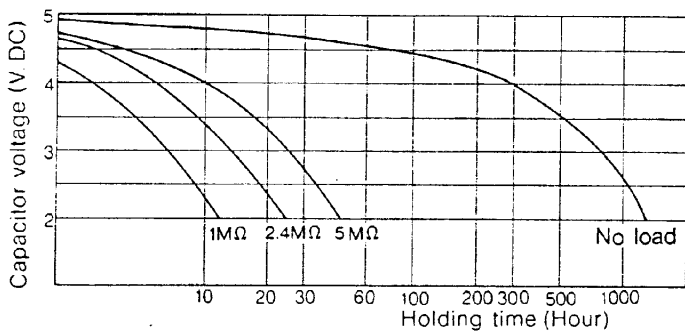
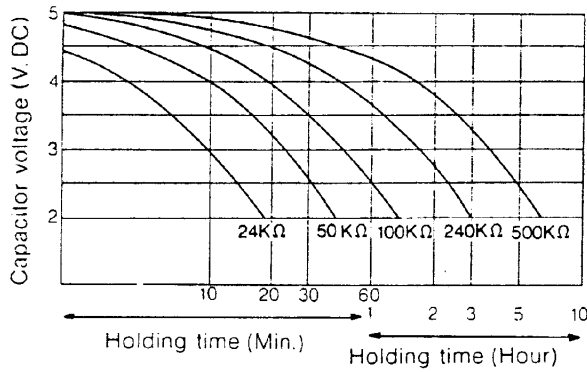


Discharge current vs. back-up time

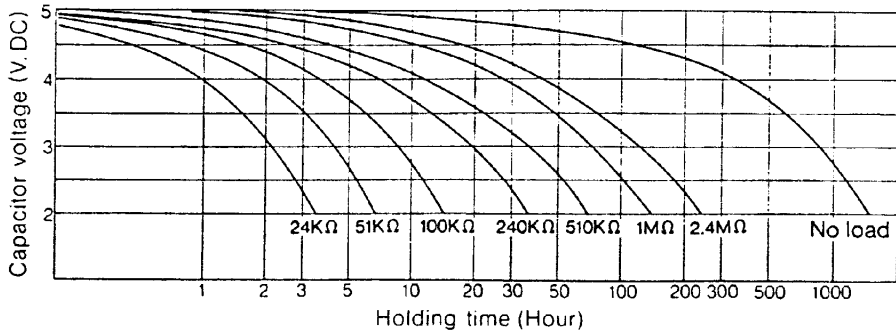
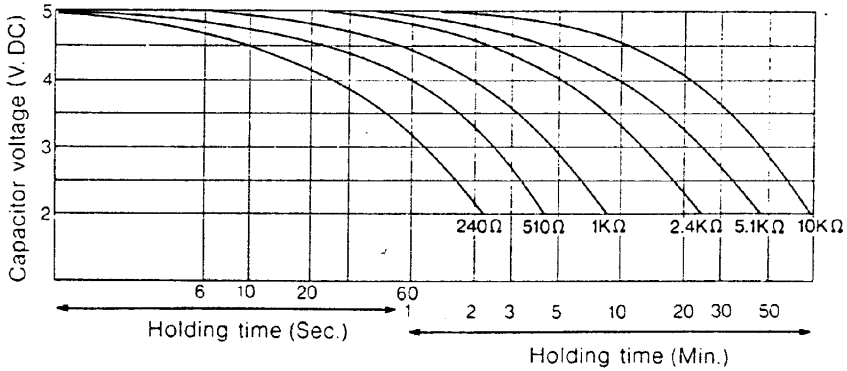


Resistance values vs. discharge characteristics (at +25°C)

● 5.5V, 0.047F

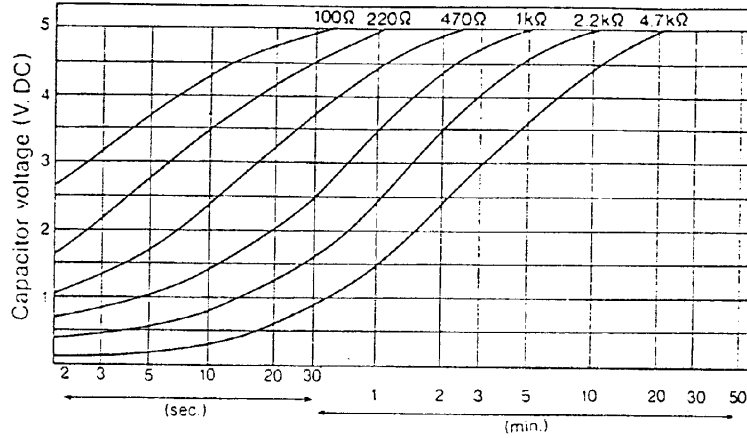


● 5.5V, 0.47F

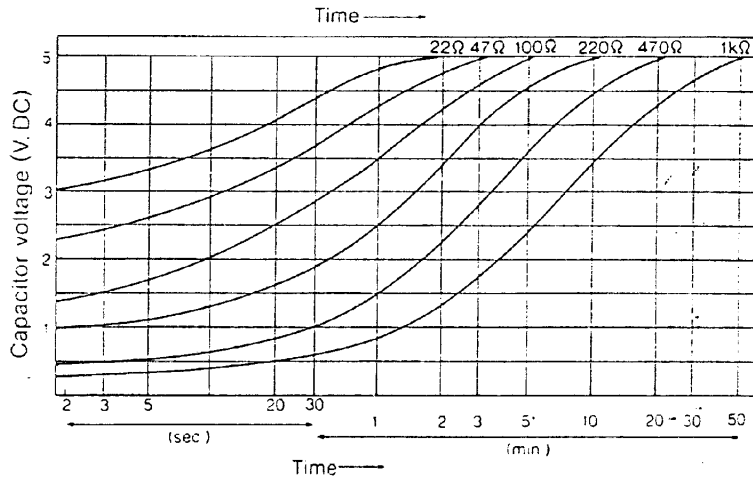


Resistance values vs. charge characteristics (at +25 °C)

● 5.5V, 0.047F

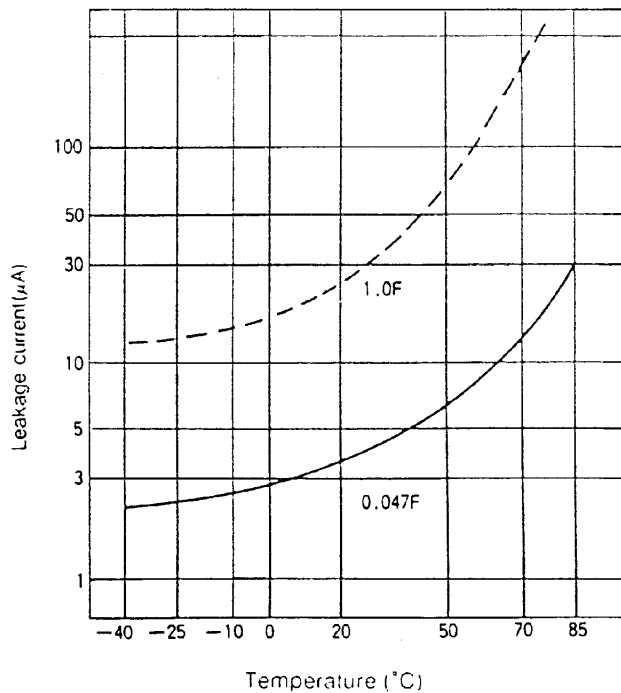


● 5.5V, 0.47F



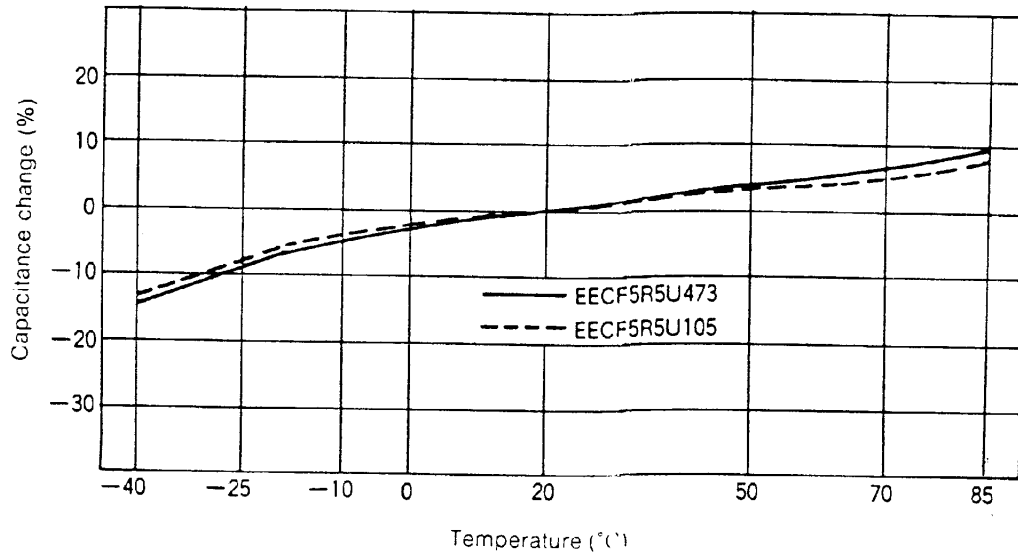
● Leakage current

(5.5V: 30 minutes)

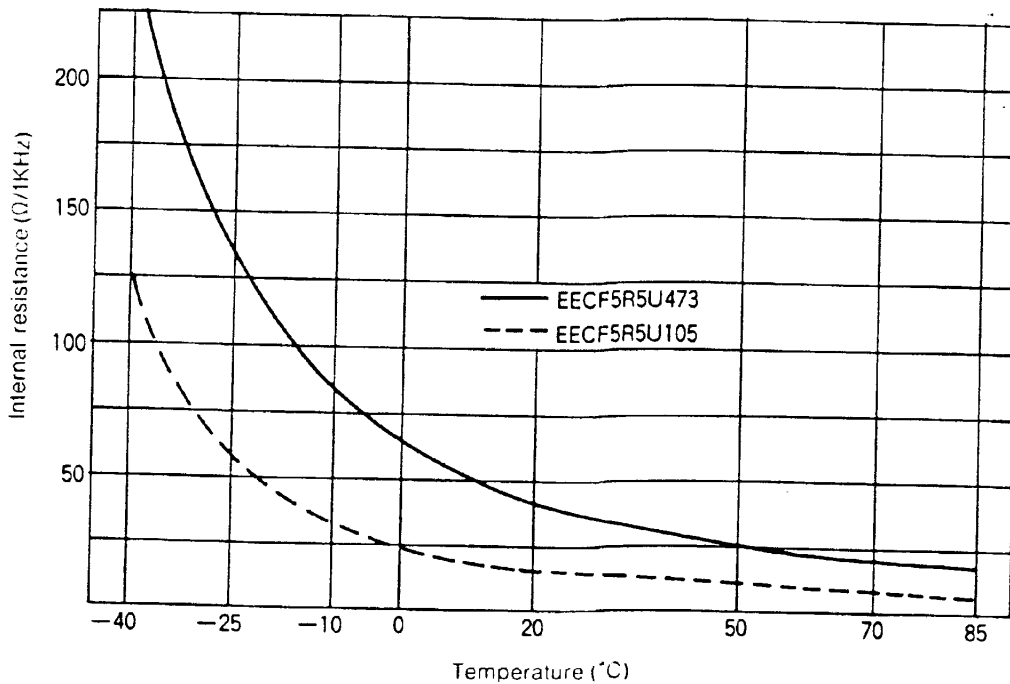


Temperature characteristics

● Capacitance



● Internal resistance



Load life characteristics (at + 70°C)

● 5.5V, 0.047F

● 5.5V, 0.47F

