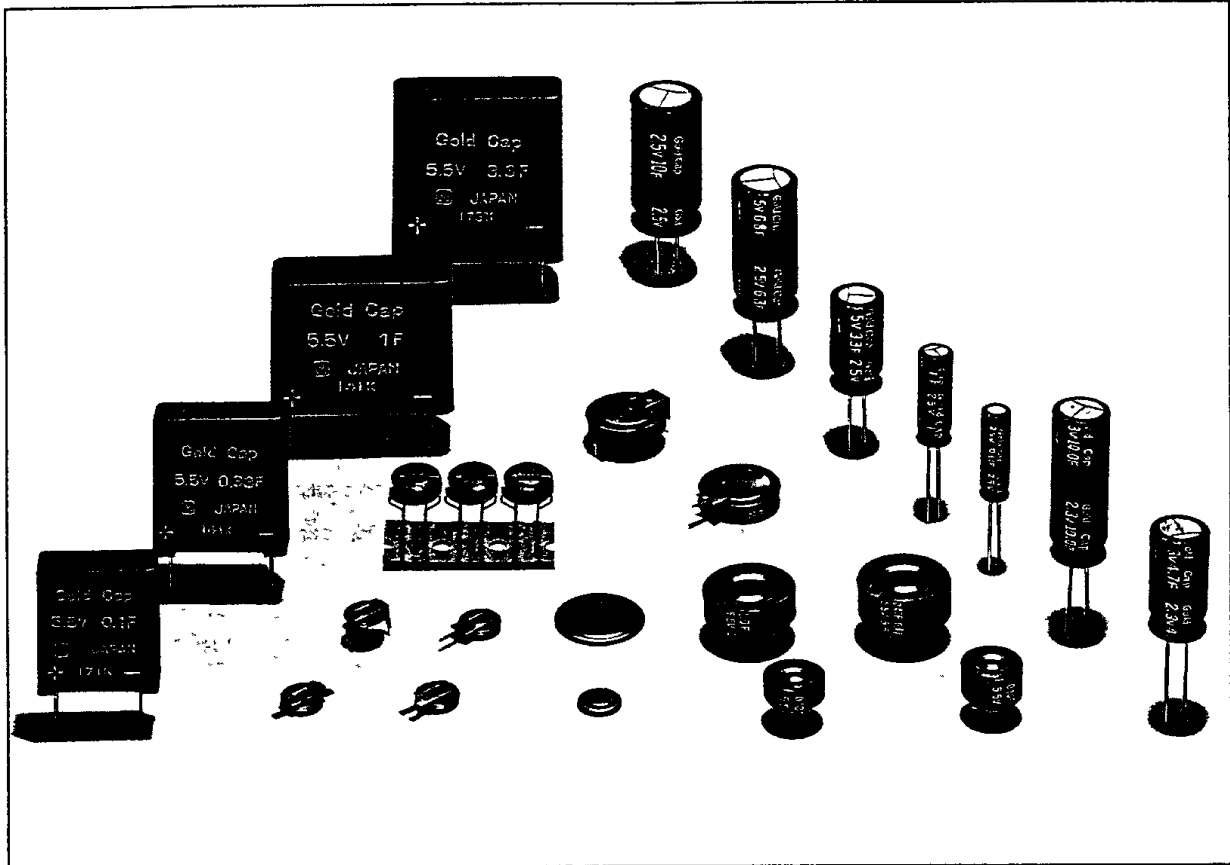


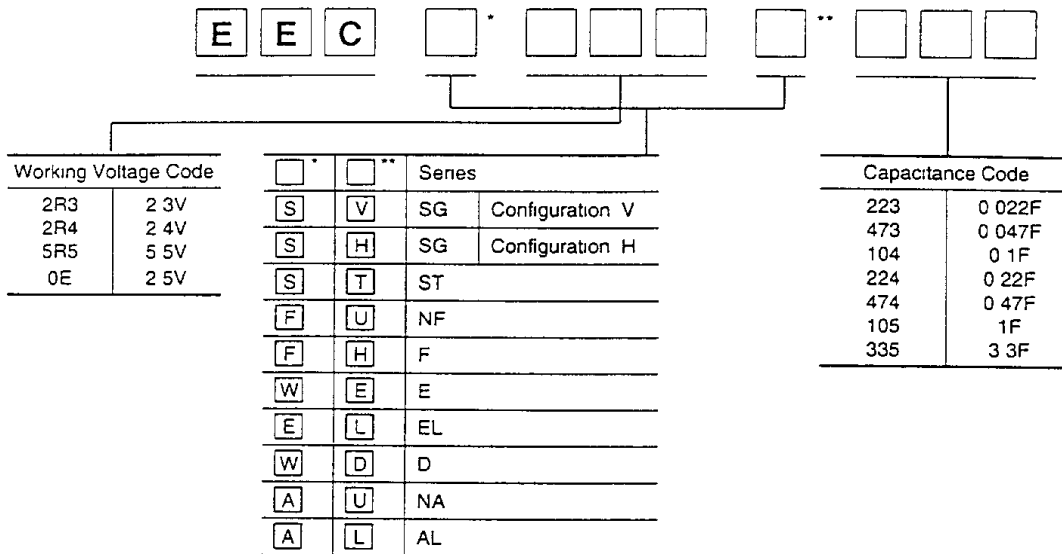
Gold Capacitors

For IC Memory Back-up & Energy Storage



Series	Load Current	Working Voltage [V DC]	Nominal Capacitance Range [F]	Capacitance Tolerance [%]	Operating Temperature Range [°C]	High Temperature Loading	Page
SG	µA range	5.5	0.022 to 1.0	-20 to +80	-25 to +70	1000 hours at +70°C	6
ST	µA range	5.5	0.022 to 0.22	-20 to +80	-25 to +70	1000 hours at +70°C	7
NF	µA range	5.5	0.022 to 1.0	-20 to +80	-25 to +70	1000 hours at +70°C	8
F	µA range	5.5	0.033 to 0.68	-20 to +80	-25 to +85	1000 hours at +85°C	9
E	µA range	2.4	0.33 to 0.68	-20 to +80	-25 to +70	1000 hours at +70°C	10
EL	µA range	2.5	0.33 to 2.0	-20 to +80	-25 to +70	1000 hours at +70°C	11, 12
D	mA range	5.5	0.1 & 0.33	-20 to +80	-25 to +70	1000 hours at +70°C	13
			1.0 & 3.3	-20 to +40			
NA	mA range	2.3	1.5 to 10	-20 to +40	-10 to +70	1000 hours at +70°C	14
AL	mA to A range	2.5	0.22 to 10	-20 to +80	-40 to +70	1000 hours at +70°C	14

Explanation of Part Numbers



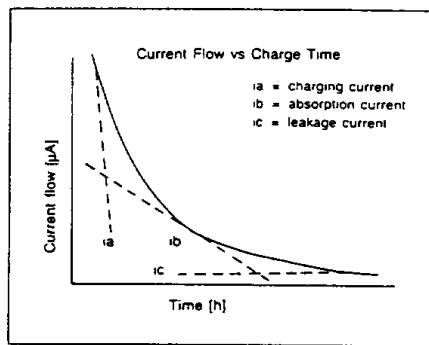
Application Note

- Gold Capacitors are not suitable for rapid charge and discharge applications and usage in this mode is not recommended. Internal heat generated by this type of operation may result in reduction of capacitance, mechanical damage and degradation of other electrical parameters.
- Do not apply a voltage in excess of the capacitor rated working voltage.
- Filtering applications where ripple currents are present are not recommended.
- Cleaning with Halogenated Hydrocarbon solvents
 - Immersion (ultrasonic wave is acceptable) and/or vapor methods at a temperature of boiling point or less at 1 atm
 - Cleaning time, ≤ 5 minutes (total)
- Capacitor life is highly dependent upon ambient operating temperature. Do not operate or subject the capacitor to temperatures in excess of its rating. For achieving the greatest life expectancy, it is recommended to operate at a reduced temperature.
- Operation under high humidity, moisture laden or corrosive gaseous atmospheres are not recommended. Because terminals and/or cases may corrode and cause an open circuit.
- Excessive thermal stress during soldering may cause leakage of electrolyte and degradation of electrical properties. Recommended soldering conditions are as follows: Solder path temperature, $\leq +260^{\circ}\text{C}$; Immersion time, ≤ 10 seconds.

Definition of Inflow Current

"Inflow Current" in STANDARD PRODUCTS TABLE is defined as the current flow after a 30, a 60 or a 90 minute charge period at rated working voltage $+20^{\circ}\text{C}$.

This current flow is the term given to the combination of currents flowing in a Gold Capacitor during its charge cycle. Unlike other capacitors, a Gold Capacitor takes longer to charge because of its high capacitance. The current flow in a Gold Capacitor passes through three phases:



The charging current (i_a) is that current which the capacitor stores and is available for discharge.

The absorption current (i_b) is that current which is absorbed by the capacitor and is not available for discharge.

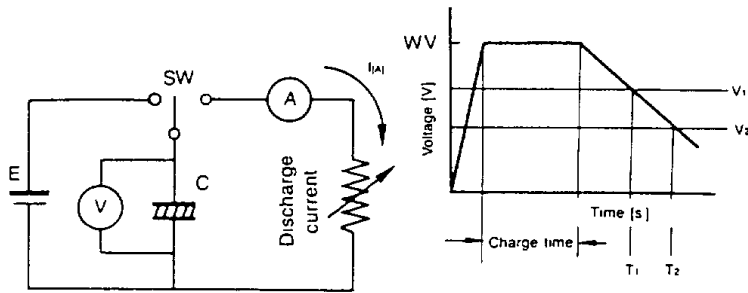
The leakage current (i_c) is that current which flows through the capacitor due to the resistive losses of dielectric.

The reading of current flow after approximately 100 hours application of rated working voltage would present leakage current.

Measurement Procedures

Initialization of test samples Prior to test, Capacitors shall be charged at rated working voltage for 2 hours and discharged in short circuit for 12 to 24 hours under the condition of +20°C ± 10°C and 65% ± 10% RH

1) Capacitance

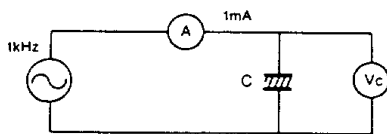


	SG, ST, NF, F Series	E, EL Series	D Series	NA, AL Series
Charge time	30 min	30 min	60 min	60 min
V ₁	3.0 V	1.5 V	3.0 V	1.0 V
V ₂	2.5 V	1.0 V	2.5 V	0.5 V

$$C[F] = \frac{I[A] \times (T_2 - T_1) [s]}{V_1 - V_2[V]}$$

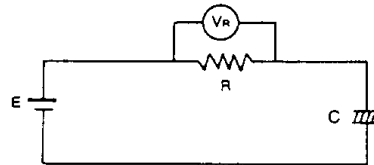
The discharge current shall be calculated by the capacitance value in a ratio of 1mA/F

2) Internal Resistance



$$Z[\Omega] = \frac{V_c}{10^{-3}}$$

3) Inflow Current



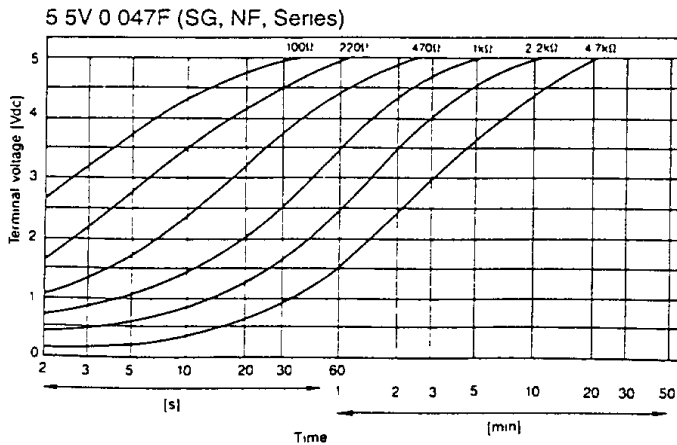
$$I[A] = \frac{V_R}{R}$$

Inflow current shall be measured after a 30, a 60 or a 90 minute application of the rated working voltage

Characteristics

■ Charging Characteristics

● Terminal Voltage vs Times (+20°C)

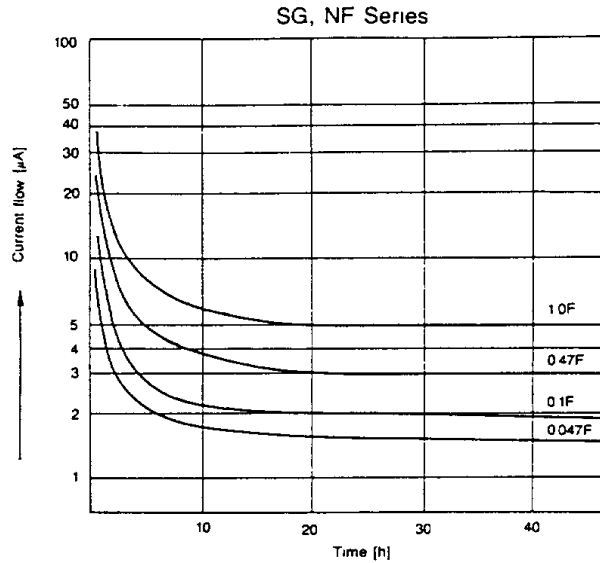


(Note)

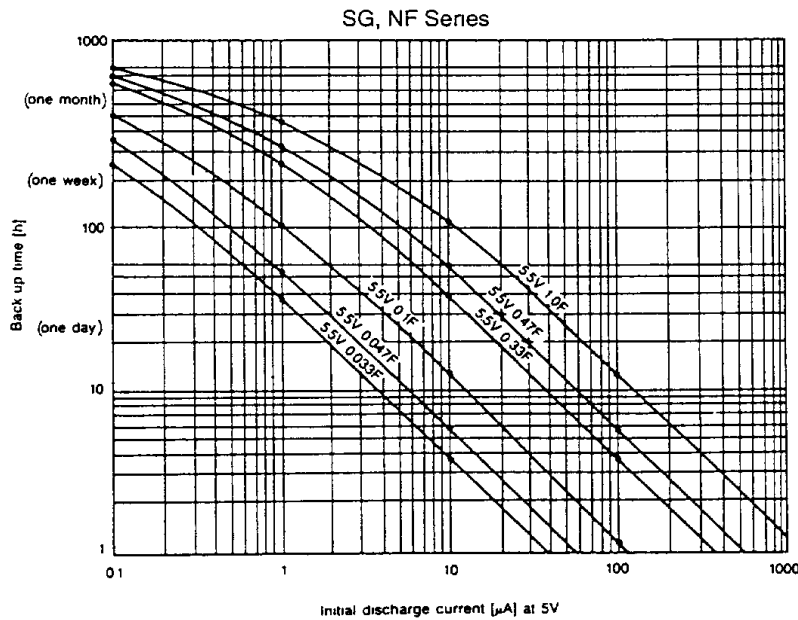
Measuring conditions

After being shorted for 60 minutes at +20°C, the capacitor is charged up to 5V DC through the series resistor specified in the graph connected to a 5V power supply

- Charging Characteristics (continued)
- Current Flow vs Charge Time (+20°C)



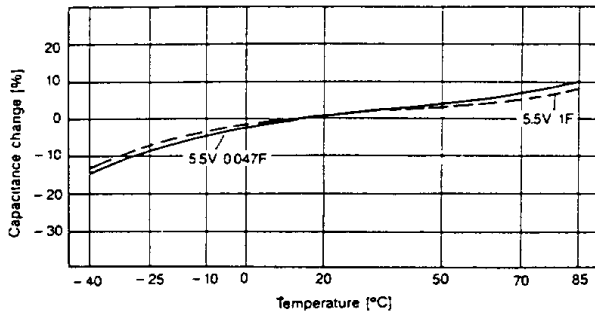
- Holding Characteristics
- Discharge Current vs Back-up Time (+20°C)



The back-up time is defined as the time taken for the capacitor to discharge from 5VDC to 2VDC with a constant resistive load.

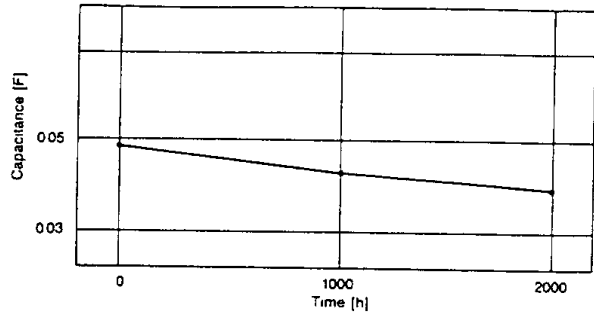
■ Temperature Characteristics

- Capacitance vs Temperature
SG, NF Series



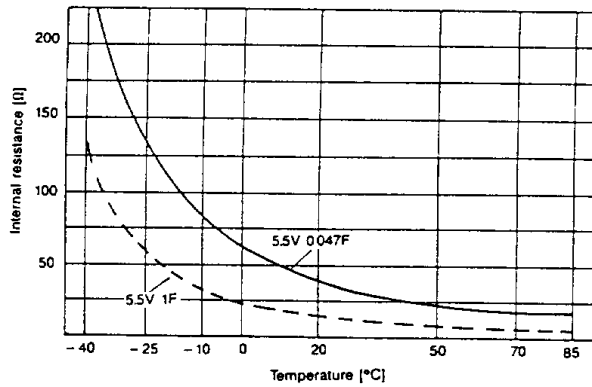
■ High Temperature Loading (+70°C)

- Capacitance vs Time
5 5V 0.047F (SG, NF Series)



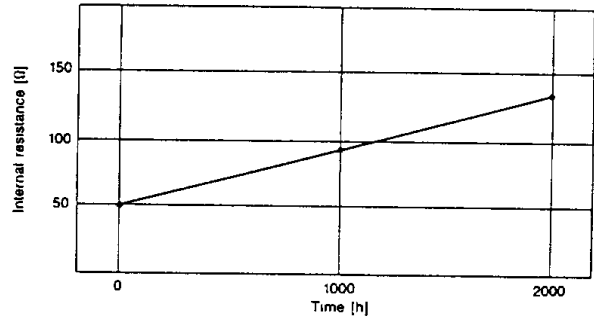
- Internal Resistance (1kHz) vs Temperature

SG, NF, Series



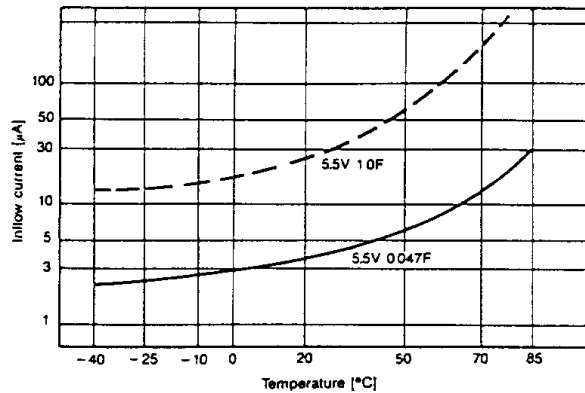
- Internal Resistance vs Time

5 5V 0.047F (SG, NF Series)



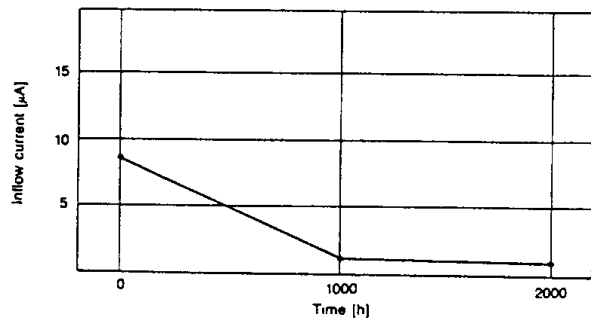
- Inflow Current vs Temperature

SG, NF Series



- Inflow Current vs Time

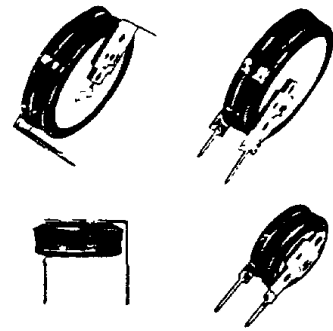
5 5V 0.047F (SG, NF Series)



Gold Capacitor Series SG

Features

- IC memory back-up device (μA range load)
- Volumetric efficiency (50% smaller than NF series)
- Light weight (1.2g)
- General purpose

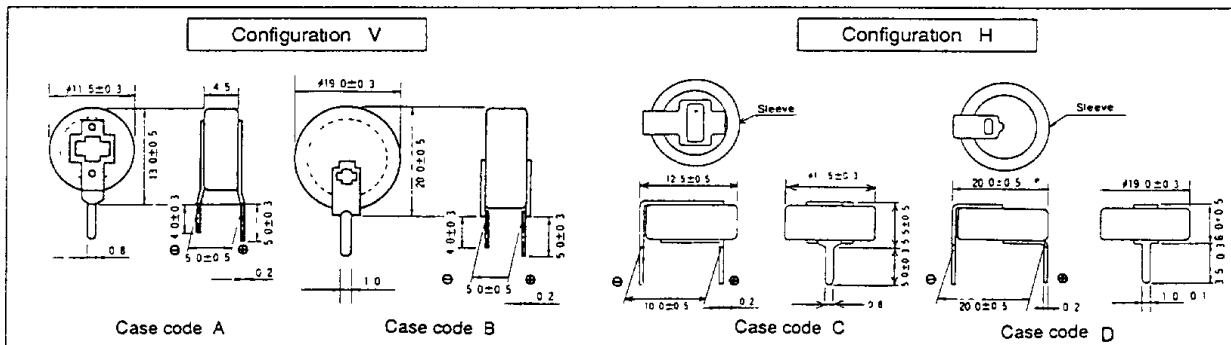


Specifications

Item	Performance Characteristics		
Operating Temperature Range	-25 to +70°C		
Rated Working Voltage	5.5V DC		
Nominal Capacitance Range	0.022F to 1.0F (+20°C)		
Capacitance Tolerance	-20% to +80%		
Inflow Current	Refer to "Standard products table" for each value		
Internal Resistance	Refer to "Standard products table" for each value		
Characteristics at High and Low Temperature	-25°C & +70°C	Capacitance change	$\leq \pm 30\%$ of the measured value at +20°C
	-25°C	Internal resistance	≤ 5 times of the measured value at +20°C
	+70°C	Inflow current	≤ 4 times of the measured value at +20°C
High Temperature Loading	The capacitor shall meet the following limits after 1,000 hours application of 5.5V DC at +70°C Capacitance change : $\leq \pm 30\%$ of the initial measured value Internal resistance ≤ 4 times of the initial specified value Inflow current ≤ 2 times of the initial specified value		
Shelf Life	The capacitor shall meet the limits for "High Temperature Loading" after 1,000 hours exposure at +70°C with no voltage applied.		
Loading with Moisture	The capacitor shall meet the limits specified for "High Temperature Loading" after 500 hours exposure at +55°C/90 to 95% RH with 5.5V DC applied		

Dimensions

[mm]



Standard Products Table

Rated working voltage [V DC]	Nominal capacitance [F]	Part number*	Inflow current** [μA]	Internal resistance [Ω] at 1kHz	Case code	
					V	H
5.5	0.022	EECS5R5 □ 223	40	150	A	C
	0.047	EECS5R5 □ 473	70	120	A	C
	0.10	EECS5R5 □ 104	100	75	A	C
	0.22	EECS5R5 □ 224	165	75	A	C
	0.47	EECS5R5 □ 474	215	30	B	D
	1.0	EECS5R5 □ 105	315	30	B	D

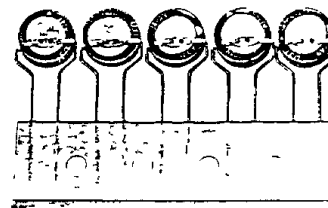
* □ = V (Configuration V) or H (Configuration H)

** Inflow current shown in table is measured after 30 minutes application of rated working voltage. In actual use, this current will decrease to several μA level after approximately 10 hours application of rated working voltage.

Gold Capacitor Series ST

Features

- Lead taping type of SG series
- IC memory back-up device (μA range load)
- Volumetric efficiency (50% smaller than NF series)
- General purpose



Specifications

Item	Performance Characteristics		
Operating Temperature Range	-25 to +70°C		
Rated Working Voltage	5.5V DC		
Nominal Capacitance Range	0.022F to 0.22F (+20°C)		
Capacitance Tolerance	-20% to +80%		
Inflow Current	Refer to "Standard products table" for each value		
Internal Resistance	Refer to "Standard products table" for each value		
Characteristics at High and Low Temperature	-25°C & +70°C	Capacitance change	$\leq \pm 30\%$ of the measured value at +20°C
	-25°C	Internal resistance	≤ 5 times of the measured value at +20°C
	+70°C	Inflow current	≤ 4 times of the measured value at +20°C
High Temperature Loading	The capacitor shall meet the following limits after 1,000 hours application of 5.5V DC at +70°C		
	Capacitance change	$\leq \pm 30\%$ of the initial measured value	
	Internal resistance	≤ 4 times of the initial specified value	
	Inflow current	≤ 2 times of the initial specified value	
Shelf Life	The capacitor shall meet the limits for "High Temperature Loading" after 1,000 hours exposure at +70°C with no voltage applied		
Loading with Moisture	The capacitor shall meet the limits specified for "High Temperature Loading" after 500 hours exposure at +55°C/90 to 95% RH with 5.5V DC applied		

Dimensions

[mm]

Code	Dimensions	Tolerance
ϕd	0.6	± 0.05
P_0	12.7	± 0.2
F	5.0	± 0.8
W	18.0	± 0.5
W_0	≥ 12.5	—
W_1	9.0	± 0.5
W_2	0-3.0	—
H_0	16.0	± 0.5
	18.0	± 0.5
ϕD_0	4.0	± 0.2
P	12.7	± 1.0
P_1	3.85	± 0.5
P_2	6.35	± 1.0
$\Delta h, \Delta h_1$	0	± 1.0
H_1	29.5($H_0.16$)	± 0.5
	31.5($H_0.18$)	± 0.5

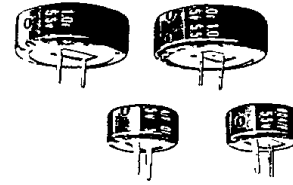
Packing q'ty 1500 pcs

Standard Products Table

Rated working voltage [V DC]	Nominal capacitance [F]	Part number	Inflow current* [μA]	Internal resistance [Ω] at 1kHz
5.5	0.022	EECS5R5T223	40	150
	0.047	EECS5R5T473	70	120
	0.10	EECS5R5T104	100	75
	0.22	EECS5R5T224	165	75

* Inflow current shown in table is measured after 30 minutes application of rated working voltage. In actual use, this current will decrease to several μA level after approximately 10 hours application of rated working voltage.

Gold Capacitor Series NF



Features

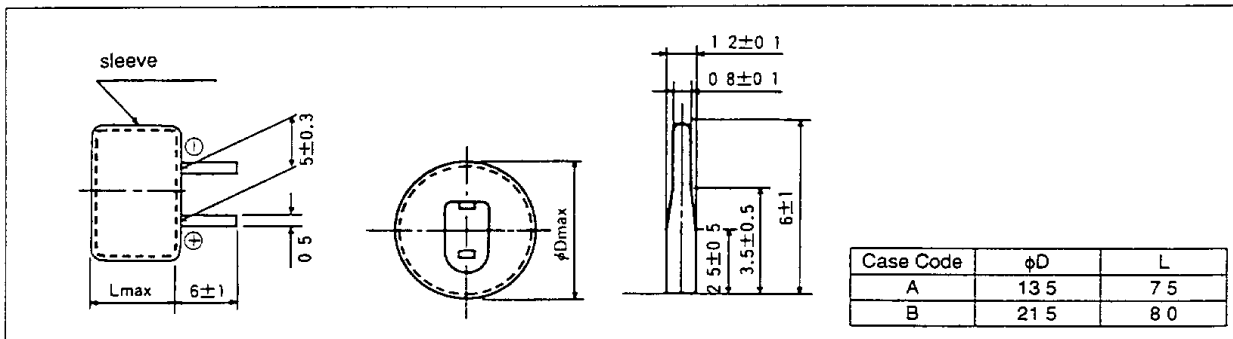
- IC memory back-up device (μA range load)
- Large capacitance for long time back-up
- General purpose
- 5mm terminal spacing

Specifications

Item	Performance Characteristics		
Operating Temperature Range	-25 to +70°C		
Rated Working Voltage	5.5V DC		
Nominal Capacitance Range	0.022F to 1.0F (+20°C)		
Capacitance Tolerance	-20% to +80%		
Inflow Current	Refer to "Standard products table" for each value		
Internal Resistance	Refer to "Standard products table" for each value		
Characteristics at High and Low Temperature	-25°C & +70°C	Capacitance change	$\leq \pm 30\%$ of the measured value at +20°C
	-25°C	Internal resistance	≤ 5 times of the measured value at +20°C
	+70°C	Inflow current	≤ 4 times of the measured value at +20°C
High Temperature Loading	The capacitor shall meet the following limits after 1,000 hours application of 5.5V DC at +70°C		
	Capacitance change	$\leq \pm 30\%$ of the initial measured value	
	Internal resistance	≤ 4 times of the initial specified value	
	Inflow current	≤ 2 times of the initial specified value	
Shelf Life	The capacitor shall meet the limits for "High Temperature Loading" after 1,000 hours exposure at +70°C with no voltage applied		
Loading with Moisture	The capacitor shall meet the limits specified for "High Temperature Loading" after 500 hours exposure at +55°C/90 to 95% RH with 5.5V DC applied		

Dimensions

[mm]

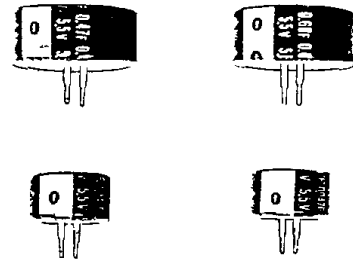


Standard Products Table

Rated working voltage [V DC]	Nominal capacitance [F]	Case code	Part number	Inflow current* [μA]	Internal resistance [Ω] at 1kHz
5.5	0.022	A	EECF5R5U223	40	150
	0.033	A	EECF5R5U333	60	150
	0.047	A	EECF5R5U473	70	120
	0.1	A	EECF5R5U104	100	75
	0.22	A	EECF5R5U224	165	75
	0.33	B	EECF5R5U334	180	40
	0.47	B	EECF5R5U474	215	30
	1.0	B	EECF5R5U105	315	30

* Inflow current shown in table is measured after 30 minutes application of rated working voltage. In actual use, this current will decrease to several μA level after approximately 10 hours application of rated working voltage.

Gold Capacitor Series F



Features

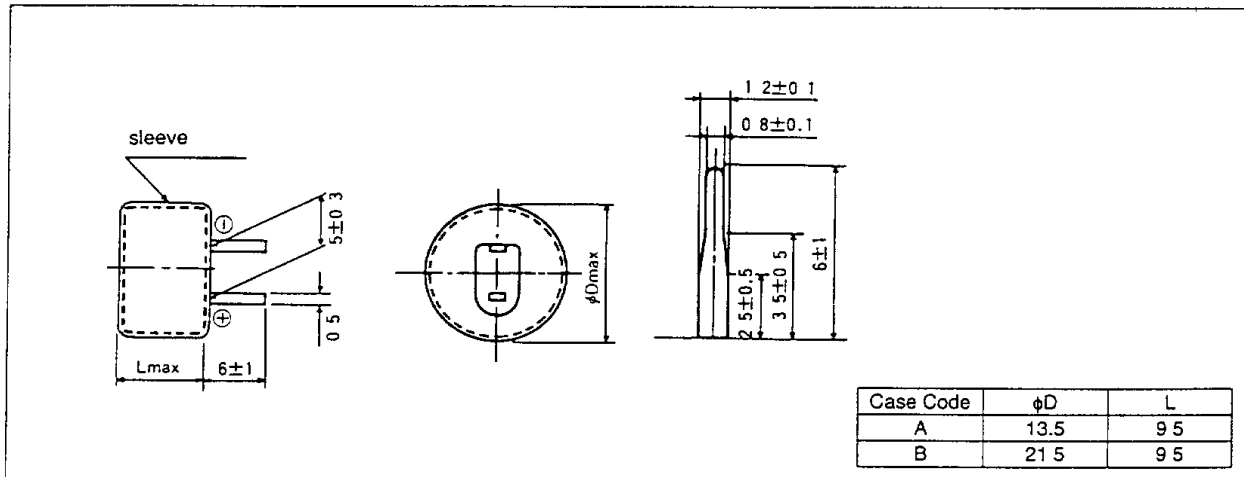
- IC memory back-up device (μA range load)
- Industrial grade (max. temperature: $+85^\circ\text{C}$)

Specifications

Item	Performance Characteristics		
Operating Temperature Range	-25 to $+85^\circ\text{C}$		
Rated Working Voltage	5.5V DC		
Nominal Capacitance Range	0.033F to 0.68F ($+20^\circ\text{C}$)		
Capacitance Tolerance	-20% to $+80\%$		
Inflow Current	Refer to "Standard products table" for each value		
Internal Resistance	Refer to "Standard products table" for each value		
Characteristics at High and Low Temperature	-25°C & $+85^\circ\text{C}$	Capacitance change	$\leq \pm 30\%$ of the measured value at $+20^\circ\text{C}$
	-25°C	Internal resistance	≤ 5 times of the measured value at $+20^\circ\text{C}$
	$+85^\circ\text{C}$	Inflow current	≤ 4 times of the measured value at $+20^\circ\text{C}$
High Temperature Loading	The capacitor shall meet the following limits after 1,000 hours application of 5.5V DC at $+85^\circ\text{C}$ Capacitance change $\leq \pm 30\%$ of the initial measured value Internal resistance ≤ 4 times of the initial specified value Inflow current ≤ 2 times of the initial specified value		
Shelf Life	The capacitor shall meet the limits for "High Temperature Loading" after 1,000 hours exposure at $+85^\circ\text{C}$ with no voltage applied		
Loading with Moisture	The capacitor shall meet the limits specified for "High Temperature Loading" after 500 hours exposure at $+55^\circ\text{C}/90$ to 95% RH with 5.5V DC applied		

Dimensions

[mm]



Standard Products Table

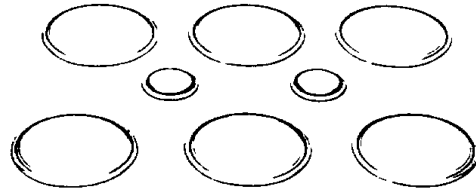
Rated working voltage [V DC]	Nominal capacitance [F]	Case code	Part number	Inflow current* [μA]	Internal resistance [Ω] at 1kHz
5.5	0.033	A	EECF5R5H333	60	150
	0.047	A	EECF5R5H473	70	120
	0.1	A	EECF5R5H104	100	100
	0.47	B	EECF5R5H474	215	75
	0.68	B	EECF5R5H684	315	50

* Inflow current shown in table is measured after 30 minutes application of rated working voltage. In actual use, this current will decrease to several μA level after approximately 10 hours application of rated working voltage.

Gold Capacitor Series E

Features

- Energy Storage Device for Solar Watch Applications
- Suitable for μA Range Load
- Coin Type



Specifications

Item	Performance Characteristics		
Operating Temperature Range	-25°C to +70°C		
Rated Working Voltage	2.4V DC		
Nominal Capacitance Range	0.33F to 0.68F (+20°C)		
Capacitance Tolerance	-20% to +80%		
Inflow Current	(Refer to "Standard products table" for each value)		
Internal Resistance	(Refer to "Standard products table" for each value)		
Characteristics at High and Low Temperature	-25°C & +70°C	Capacitance change	$\leq \pm 30\%$ of the measured value at +20°C
	-25°C	Internal resistance	≤ 4 times of the measured value at +20°C
	+70°C	Inflow current	≤ 3 times of the measured value at +20°C
High Temperature Loading	The capacitor shall meet the following limits after a 1,000 hour application of 2.4V DC at +70°C		
		Capacitance change	$\leq \pm 30\%$ of the initial measured value
		Internal resistance	≤ 4 times of the initial specified value
		Inflow current	≤ 2 times of the initial specified value
Shelf Life	The capacitor shall meet the limits for "High Temperature Loading" after a 1,000 hour exposure to +70°C with no voltage applied		
Loading with Moisture	The capacitor shall meet the limits specified for "High Temperature Loading" after a 500 hour exposure to +60°C/90 to 95% RH with 2.4V DC applied		

Dimensions

[mm]

		Case code	T ₁	T ₂	D ₁	D ₂ *
		920	2.1	0.05	9.5	7.0
		1120	2.0	0.05	11.0	8.0
		2016	1.6	0.05	20.0	16.0

* D₂ is only for reference

Standard Products Table

Rated Working Voltage [V dc]	Nominal Capacitance [F]	Case Code	Part Number	Inflow Current* [μA]	Internal Resistance (1kHz) [Ω]
2.4	0.33	920	EECW2R4E334	120	40
	0.47	1120	EECW2R4E474	160	40
	0.68	2016	EECW2R4E684	150	10

* Inflow current shown in table is measured after a 30 minute application of rated working voltage. In actual use, this current will decrease to several μA level after approximately 10 hours application of rated working voltage.

Gold Capacitor Series EL



Features

- IC memory back-up device (μA range load)
- Coin type with various terminal style
- Suitable for application in limited space

Specifications

Item	Performance Characteristics		
Operating Temperature Range	-25 to +70°C		
Rated Working Voltage	2.5V DC		
Nominal Capacitance Range	0.33 to 2.0F		
Capacitance Tolerance	-20% to +80%		
Inflow Current	Refer to "Standard products table" for each value		
Internal Resistance	Refer to "Standard products table" for each value		
Characteristics at High and Low Temperature	-25°C & +70°C	Capacitance change	$\leq \pm 30\%$ of the measured value at +20°C
	-25°C	Internal resistance	≤ 5 times of the measured value at +20°C
	+70°C	Inflow current	≤ 4 times of the measured value at +20°C
High Temperature Loading	The capacitor shall meet the following limits after 1,000 hours application of 2.5V DC at +70°C		
	Capacitance change	$\leq \pm 30\%$ of the initial measured value	
	Internal resistance	≤ 4 times of the initial specified value	
	Inflow current	≤ 2 times of the initial specified value	
Shelf Life	The capacitor shall meet the limits for "High Temperature Loading" after 1,000 hours exposure at +70°C with no voltage applied		
Loading with Moisture	The capacitor shall meet the limits specified for "High Temperature Loading" after 500 hours exposure at +55°C/90 to 95% RH with 2.5V DC applied		

Standard Products Table

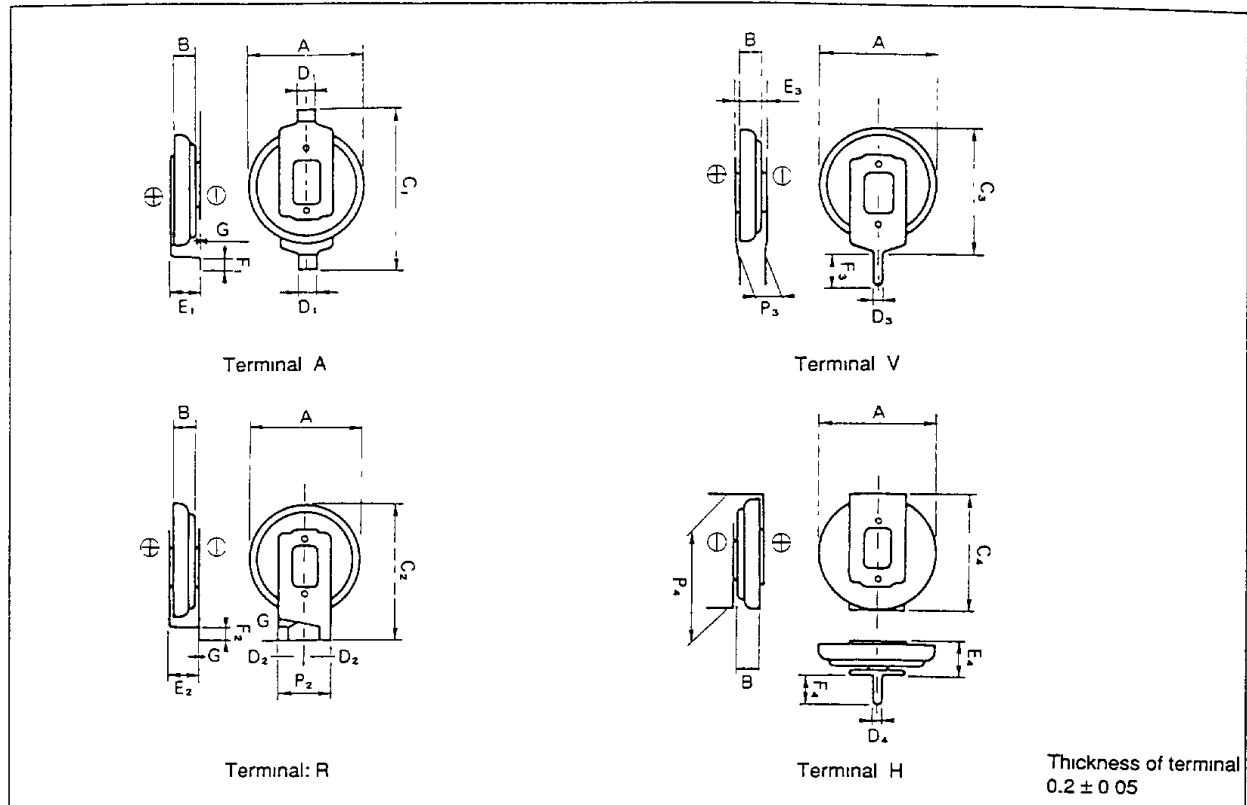
Rated working voltage [V.DC]	Nominal capacitance [F]	Part number*	Inflow current** [μA]	Internal resistance [Ω] at 1kHz
2.5	0.33	EECE0EL334 □	120	40
	0.47	EECE0EL474 □	160	40
	0.68	EECE0EL684 □	150	10
	2.0	EECE0EL205 □	230	15

* □ Terminal configurations A/R V/H

** Inflow current shown in table is measured after 30 minutes application of rated working voltage. In actual use, this current will decrease to several μA level after approximately 10 hours application of rated working voltage.

Dimensions

[mm]



Terminal A

Part No	$A \begin{smallmatrix} +0 \\ -0.3 \end{smallmatrix}$	$B \begin{smallmatrix} +0 \\ -0.2 \end{smallmatrix}$	$C_1 \pm 0.5$	$D_1 \pm 0.1$	$E_1 \text{ max}$	$F_1 \pm 0.2$	$G \text{ max}$
EECE0EL334A	9.5	2.1	15.5	2.0	2.9	2.0	0.5
EECE0EL474A	11.0	2.0	17.0	2.0	2.8	2.0	0.5
EECE0EL684A	20.0	1.6	26.0	2.0	2.5	2.0	0.5
EECE0EL205A	18.5	2.2	24.5	2.0	3.0	2.0	0.5

Terminal: R

Part No	$A \begin{smallmatrix} +0 \\ -0.3 \end{smallmatrix}$	$B \begin{smallmatrix} +0 \\ -0.2 \end{smallmatrix}$	$C_2 \text{ max}$	$D_2 \pm 0.1$	$E_2 \text{ max.}$	$F_2 \pm 0.2$	$G \text{ max.}$	$P_2 \pm 0.5$
EECE0EL334R	9.5	2.1	13.5	1.5	2.9	2.0	0.5	4.5
EECE0EL474R	11.0	2.0	15.0	1.5	2.8	2.0	0.5	5.5
EECE0EL684R	20.0	1.6	24.0	1.5	2.5	2.0	0.5	5.5
EECE0EL205R	18.5	2.2	22.5	1.5	3.0	2.0	0.5	5.5

Terminal V

Part No	$A \begin{smallmatrix} +0 \\ -0.3 \end{smallmatrix}$	$B \begin{smallmatrix} +0 \\ -0.2 \end{smallmatrix}$	$C_3 \text{ max}$	$D_3 \pm 0.1$	$E_3 \text{ max.}$	$F_3(+)\pm 0.3$	$F_3(-)\pm 0.3$	$P_3 \pm 0.5$
EECE0EL334V	9.5	2.1	12.0	0.8	2.9	5.0	4.0	3.0
EECE0EL474V	11.0	2.0	13.0	0.8	2.8	5.0	4.0	3.0
EECE0EL684V	20.0	1.6	22.0	0.8	2.5	5.0	4.0	3.0
EECE0EL205V	18.5	2.2	20.5	0.8	3.0	5.0	4.0	3.0

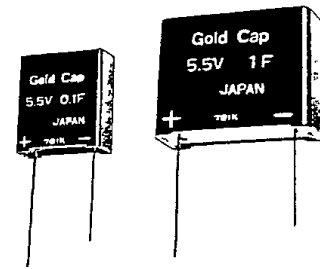
Terminal. H

Part No	$A \begin{smallmatrix} +0 \\ -0.3 \end{smallmatrix}$	$B \begin{smallmatrix} +0 \\ -0.2 \end{smallmatrix}$	$C_4 \pm 0.5$	$D_4 \pm 0.1$	$E_4 \text{ max.}$	$F_4 \pm 0.3$	$G \text{ max}$	$P_4 \pm 0.5$
EECE0EL334H	9.5	2.1	10.5	0.8	4.0	5.0	0.5	10.0
EECE0EL474H	11.0	2.0	12.0	0.8	3.9	5.0	0.5	10.0
EECE0EL684H	20.0	1.6	21.0	0.8	3.5	5.0	0.5	20.0
EECE0EL205H	18.5	2.2	19.5	0.8	4.1	5.0	0.5	20.0

Gold Capacitor Series D

Features

- Back-up for mA range load
- Large capacitance (3.3F)
- Molded case

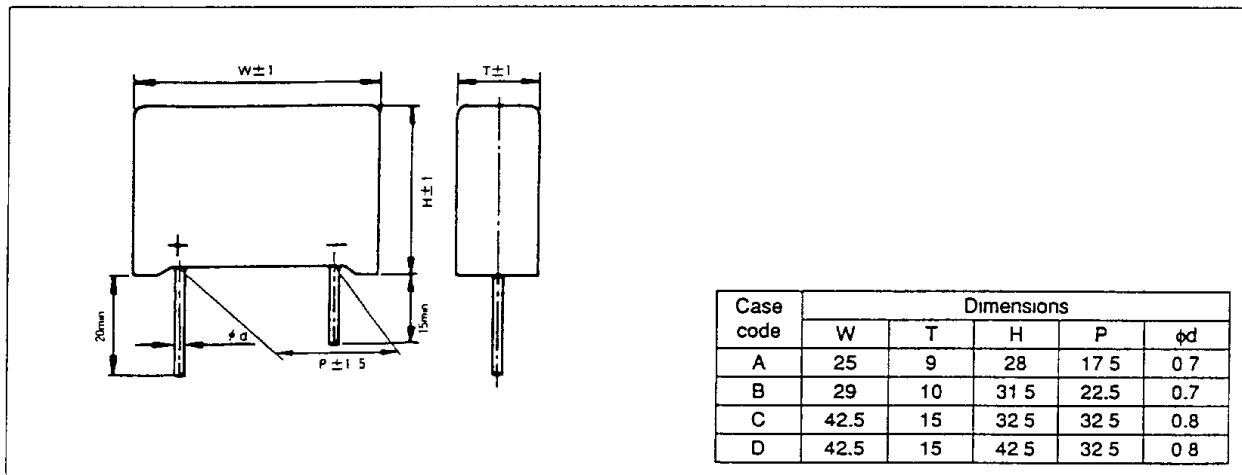


Specifications

Item	Performance Characteristics		
Operating Temperature Range	-25 to +70°C		
Rated Working Voltage	5.5V DC		
Nominal Capacitance Range	0.1F to 3.3F (+20°C)		
Capacitance Tolerance	-20% to +80% (0.1F, 0.33F), -20% to +40% (1F, 3.3F)		
Inflow Current	Refer to "Standard products table" for each value		
Internal Resistance	Refer to "Standard products table" for each value		
Characteristics at High and Low Temperature	-25°C & +70°C	Capacitance change	≤ ±30% of the measured value at +20°C
	-25°C	Internal resistance	≤ 3 times of the measured value at +20°C
	+70°C	Inflow current	≤ 3 times of the measured value at +20°C
High Temperature Loading	The capacitor shall meet the following limits after 1,000 hours application of 5.5V DC at +70°C		
	Capacitance change	: ≤ ±30% of the initial measured value	
	Internal resistance	: ≤ 2 times of the initial specified value	
	Inflow current	: ≤ 2 times of the initial specified value	
Shelf Life	The capacitor shall meet the limits for "High Temperature Loading" after 1,000 hours exposure at +70°C with no voltage applied.		
Loading with Moisture	The capacitor shall meet the limits specified for "High Temperature Loading" after 500 hours exposure at +55°C/90 to 95% RH with 5.5V DC applied.		

Dimensions

[mm]

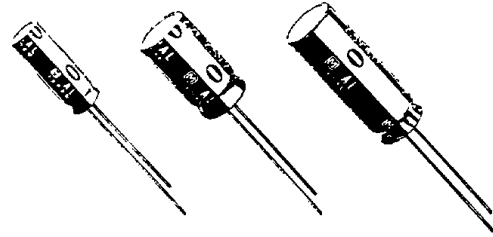


Standard Products Table

Rated working voltage [V DC]	Nominal capacitance [F]	Case code	Part number	Inflow current* [mA]	Internal resistance [Ω] at 1kHz
5.5	0.1	A	EECW5R5D104	0.12	9.0
	0.33	B	EECW5R5D334	0.18	5.0
	1	C	EECW5R5D105	0.28	5.0
	3.3	D	EECW5R5D335	0.44	2.5

* The inflow current shown in the above table is measured after 60 minutes application of rated working voltage. In actual use, this current will decrease to several μA level after approximately 10 hours application of rated working voltage.

Gold Capacitor Series NA/AL



Features

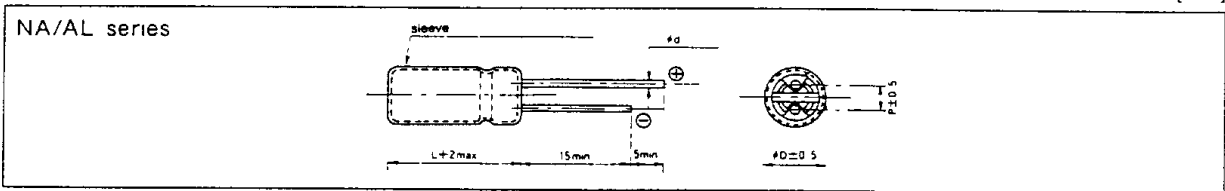
- Back-up for mA to A range load
- Large capacitance (10F)
- Miniaturized size (NA)

Specifications

Item	Performance Characteristics		
Operating Temperature Range	-10 to +70°C (NA) -40 to +70°C (AL)		
Rated Working Voltage	2.3V DC (NA) 2.5V DC (AL)		
Nominal Capacitance Range	0.22F to 10F (+20°C)		
Capacitance Tolerance	-20% to +40% (NA) -20% to +80% (AL)		
Inflow Current	Refer to "Standard products table" for each value		
Internal Resistance	Refer to "Standard products table" for each value		
Characteristics at High and Low Temperature	-25°C & +70°C	Capacitance change	≤ ±30% of the measured value at +20°C
	-10°C -40°C (AL)	Internal resistance	≤ 3 times of the measured value at +20°C
	+70°C	Inflow current	≤ 3 times of the measured value at +20°C
High Temperature Loading	The capacitor shall meet the following limits after 1,000 hour application of 2.3V DC (NA), 2.5V DC (AL) at +70°C Capacitance change ≤ ±40% (NA), ±30% (AL) of the initial measured value Internal resistance ≤ 2 times of the initial specified value Inflow current ≤ 2 times of the initial specified value		
Shelf Life	The capacitor shall meet the limits for "High Temperature Loading" after 1,000 hour exposure to +70°C with no voltage applied		
Loading with Moisture	The capacitor shall meet the limits specified for "High Temperature Loading" after a 500 hour exposure to +55°C/90 to 95% RH with 2.3V DC (NA), 2.5V DC (AL) applied		

Dimensions

[mm]



Standard Products Table

NA (2.3V) Series

Rated W V [V DC]	Capacitance [F]	Part number	Dimensions [mm]				Inflow current [mA]	Information resistance [Ω] at 1kHz
			øD	L	ød	P		
2.3	1.5	EECA2R3U155	12.5	23	0.8	5.0	0.20	2.9
	2.2	EECA2R3U225	12.5	23	0.8	5.0	0.23	2.3
	3.3	EECA2R3U335	12.5	23	0.8	5.0	0.30	1.9
	4.7	EECA2R3U475	12.5	23	0.8	5.0	0.44	1.7
	6.8	EECA2R3U685	12.5	35	0.8	5.0	0.52	1.2
	10	EECA2R3U106	12.5	35	0.8	5.0	0.60	1.1

AL (2.5V) Series

Rated W V [V DC]	Capacitance [F]	Part number	Dimensions [mm]				Inflow current [mA]	Information resistance [Ω] at 1kHz
			øD	L	ød	P		
2.5	0.22	EECA0EL224	6.8	21	0.7	2.5	0.10	2.6
	0.33	EECA0EL334	6.8	21	0.7	2.5	0.12	1.7
	0.47	EECA0EL474	8.0	22	0.7	3.5	0.14	1.3
	1.0	EECA0EL105	8.0	22	0.7	3.5	0.18	1.0
	1.5	EECA0EL155	12.5	23	0.8	5.0	0.20	0.7
	2.2	EECA0EL225	12.5	23	0.8	5.0	0.23	0.5
	3.3	EECA0EL335	12.5	23	0.8	5.0	0.30	0.3
	4.7	EECA0EL475	12.5	35	0.8	5.0	0.44	0.2
	6.8	EECA0EL685	16.0	35	0.8	7.5	0.55	0.2
	10	EECA0EL106	18.0	35	0.8	7.5	0.60	0.1

* The inflow current shown in the above table is measured after 90 minutes application of rated working voltage. In actual use, the current will decrease to several μA level after approximately 10 hours application of rated working voltage.