

■ ESD(Energy Storage Devices), EDLC(Electric Double Layer Capacitor)

The energy storage device(ESD), which has capability of generating high output pulse power and high saving, is expected to be used for small and light equipment for the electrochemical energy saving and load qualization of large output pulse power & peak power.

The important of this technology is highlighted in the environment-friendly materials, long lifetime and high efficiency of electric charge and discharge.

It is a new-generation, promising environment-friendly energy storage device utilized broadly from a back function of memory and timer for small electrical appliances and power system mobile instruments and high output pulse power source such as UPS for high value-added equipment in the fields of military, aerospace and medical service and electrical highbred automobiles (EV/HEV) to effective use of energy for electric power saving system.

-> Features

- * Longer life time than secondary battery
- * Wider operating temperature
- * Simple charge/discharge regulation circuit
- * Can be charged and discharged more than 100,000 cycles
- * Environment friendly components
- * Small size and excellent voltage holding
- * High adaptability for automatic assembly
- * High reliability and wide temperture range
- * Fast charging time and maintenance-free
- * Suitable for micro current consumption back-up such as microcomputers and memory



▷ Applications



Memory back-up for Video, Audio, Cameras, Camcorder, Telephones, Printer, Car stereo, Computer, Notebook PC, Rice cooker, Word processor, Intelligent remote

▷ Specifications

Items	Characteristics
Operating temperature	-25~ +70°C
Rated working voltage	5.5VDC
Maximum surge voltage	6.3VDC
Nominal Cap. range	0.022~300F
Capacitance tolerance	-20%~ +80%(at 25°C)
Low temperature(-25°C) characteristics	Capacitance change: $\pm 30\%$ of initial measured value at $\pm 25^\circ\text{C}$
	Internal resistance: $\leq 500\%$ of initial specified value at $\pm 25^\circ\text{C}$
Life	Capacitance change: $\pm 30\%$ of initial measured value
	Internal resistance: $\leq 400\%$ of initial specified value (After 1000hours application of rated DC working voltage at +70°C the capacitor shall meet the following limits)
Shelf life	After 1000hours storage at +70°C without load, the capacitor shall meet the specified limit for "Life"
Moisture resistance	After 500hours storage at +55°C, 90~95%R.H., without load, the capacitor shall meet the specified limit for "Life"

EDLC Standard Products

Capacitance (F)	Part number	Rated Voltage(V)	Internal resistance(Ω)	Leakage current(μ A)	Terminal Type	Case code
0.22	SEC 5R5*224z	5.5	≤ 75	≤ 135	V, H	B
0.33	SEC 5R5*334z	5.5	≤ 75	≤ 135	V, H	B
0.47	SEC 5R5*474z	5.5	≤ 30	≤ 315	V, M, H	A
	TEC 5R5*474z	5.5	≤ 75	≤ 315	M	A
	VEC 6R3*474z	6.3	≤ 75	≤ 1500	M	A
1.0	SEC 5R5*105z	5.5	≤ 30	≤ 315	V, M, H	A
	TEC 5R5*105z	5.5	≤ 50	≤ 315	M	A
	VEC 6R3*105z	6.3	≤ 50	≤ 1500	M	A
1.5	SEC 5R5*155z	5.5	≤ 30	≤ 1500	V, M	A

* : Terminal Type



S E C 5 R 5 V 1 0 5 Z







⑤ Capacitance tolerance

Tolerance	Symbol	Tolerance	Symbol
-20% ~ +80%	Z	-20% ~ +20%	M
-30% ~ +30%	N	C% ~ +100%	P
-10% ~ +20%	V	-10% ~ +30%	Q
-10% ~ +40%	K	-10% ~ +50%	T

④ Nominal capacitance code

Capacitance	Symbol	Capacitance	Symbol
2.0F	205	1.0F	105
0.47F	474	0.33F	334
0.22F	224	0.1F	104
0.047F	473	0.022F	223

③ Lead type

Form			
Symbol	M	H	V
Form			
Symbol	T	VN	SB

② Rated voltage

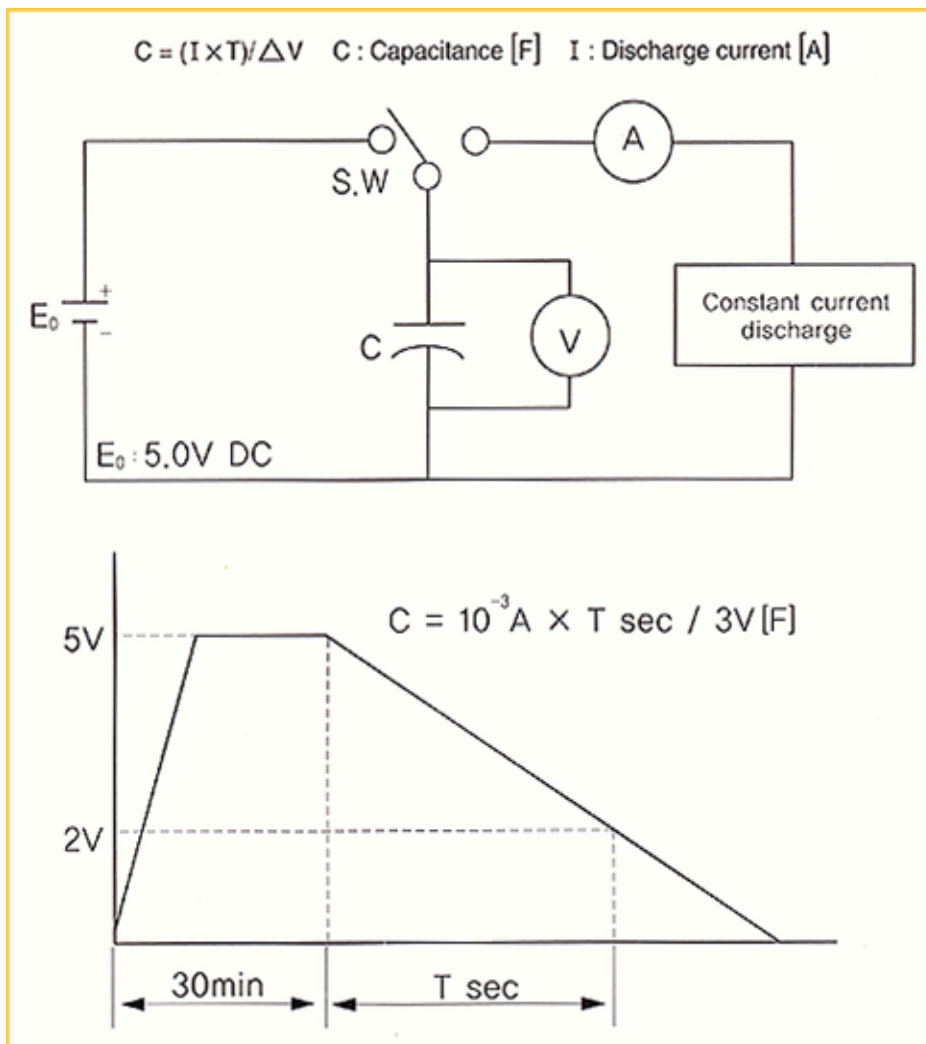
Rated voltage	2.5V	5.5V	6.3V
Symbol	2R5	5R5	6R3

① Series name

Series	Symbol	Series	Symbol
Standard	SEC	High capacitance	HEC
Mono cell	MEC	High temperature	TEC
High voltage working	VEC	Long life	LEC

▷Capacitance

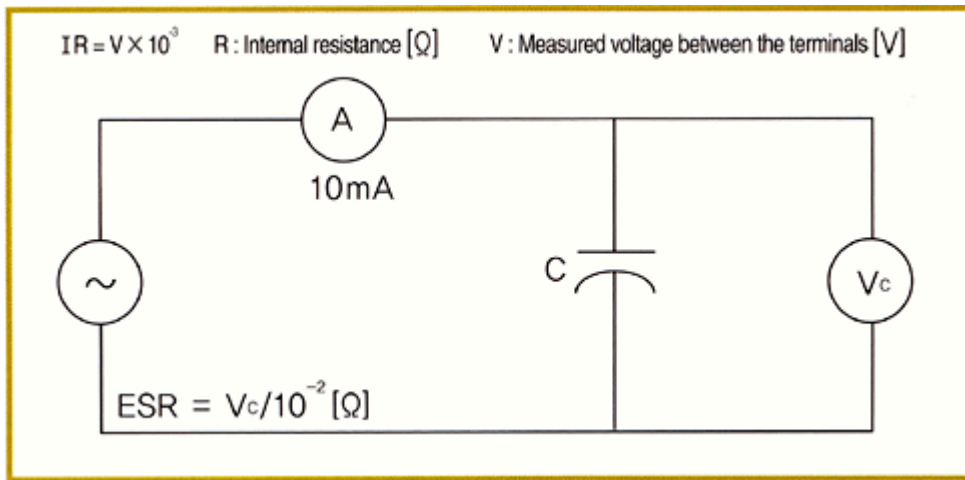
- * Capacitance shall be calculated from the equation below.
- * Capacitance shall be measured during discharge cycle.
- * PRO-CAPs are utilized to electric equipments during discharging its electric current.
- * Charge the EDLC with 5 voltage for 30 minutes by constant voltage power supply
- * Measure the time(T) for the voltage between terminals reaches from 5 to 2 V.
- * Discharging current is 1mA.



▷Equivalent Series Resistance (ESR)

- * ESR shall be calculated from the equation below.
- * Prior to measurement, both lead terminals must be short-circuited for a minimum 30 minutes.
- * The lead terminal connected to the metal case is connected to the negative side of the power supply.

* Apply 1mA current at 1KHZ, and measure the voltage between the terminals



▷Leakage Current(at 30 minutes charging)

* Leakage current shall be calculated from the equation below.

* Prior to measurement, both lead terminals must be short-circuited for a minimum 30 minutes. The lead terminal connected to the metal case is connected to the negative side of the power supply.

* Apply 5V for 30 minutes and measure the voltage.

