

Capacitor lecture

(Basic)

April.2009
Electronic Device Company

POSCAP

Tantalum Solid Capacitors with Conductive Polymer



- **Capacitors**
- **What is POSCAP?**
- **Structure of POSCAP**
- **Features of POSCAP**
- **Series Diagram of POSCAP**



● Capacitors

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Fixed Capacitors



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➤ Capacitors

Fixed Capacitor

Film Capacitor

(Feature : Cap.<1uF/Large-Size/Excellent electric characteristics)

Ceramic Capacitor

(Feature : Cap< 10-30uF/ Small size)

(Attention : Capacitance change with temperature & bias voltage)

Single Layer

Multi Layer

Electrolytic Capacitor

(Feature: Large capacitance)

(Attention: Polarized. Be careful of mounting direction.)

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Type of Electrolytic Capacitors



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➤ Electrolytic Capacitors

Electrolyte (Cathode) Metal Anode	Electrolysis solution	MnO ₂	Organic Semiconductor	
			TCNQ complex salt	Conductive Polymer
Al	Aluminum Electrolytic Capacitor	—————	OS-CON	OS-CON (SVP/SEP series)
Ta	—————	Tantalum Solid Electrolytic Capacitor	—————	POSCAP

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What is POSCAP?



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What is POSCAP?



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➤ Tantalum solid capacitors with conductive polymer electrolyte

a) Features

- Suitable for downsizing equipments due to **Low ESR** and excellent characteristics at high frequency.
- Suitable for using low temperature due to stability of ESR and impedance regardless of temperature.

b) Applications

- Smoothing circuit at DC/DC converter
- Noise filter for Power Supply
- Power supply for CPU etc.

c) Start of mass production

- Standard series in 1997
- More than 14 series and 300 models have been developed up to now.

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Types of POSCAP



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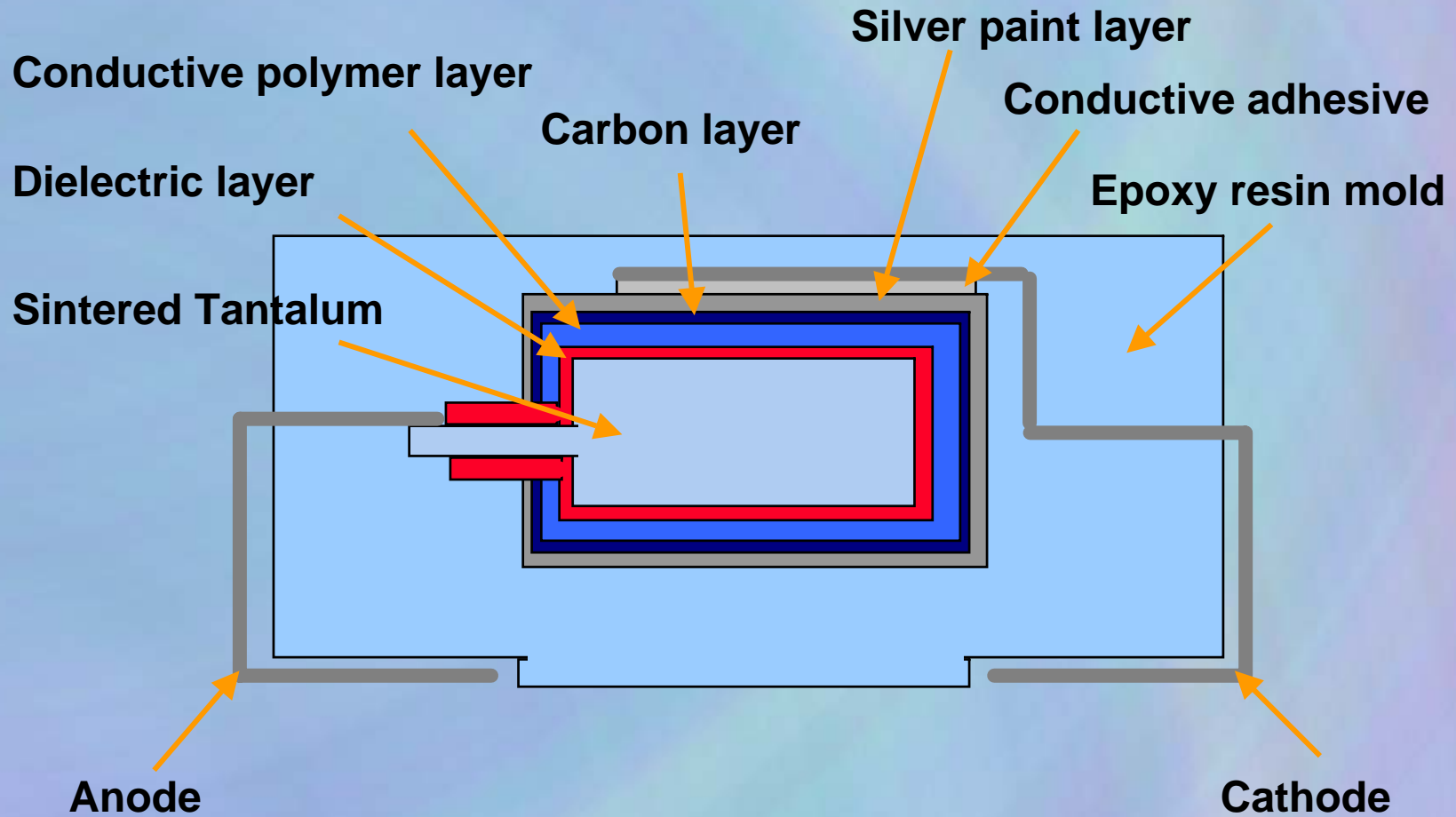
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Structure of POSCAP



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➤ Standard



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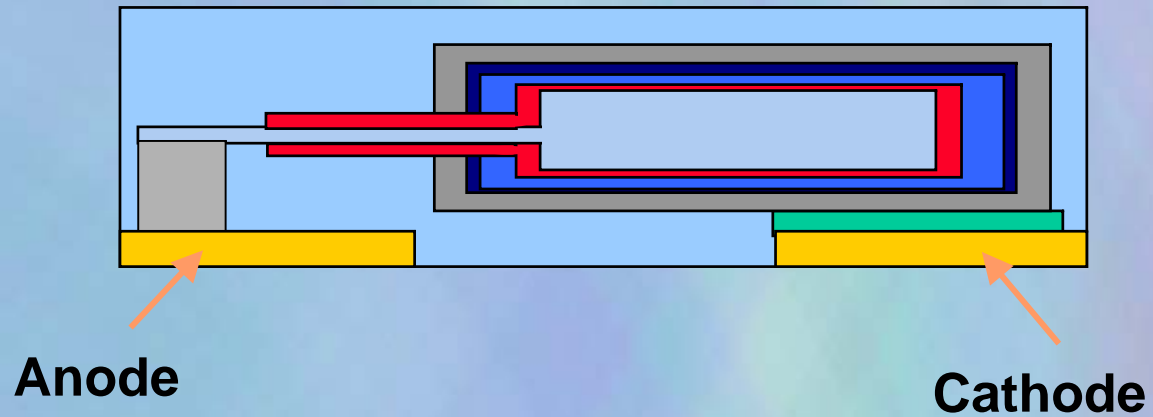
Structure of POSCAP



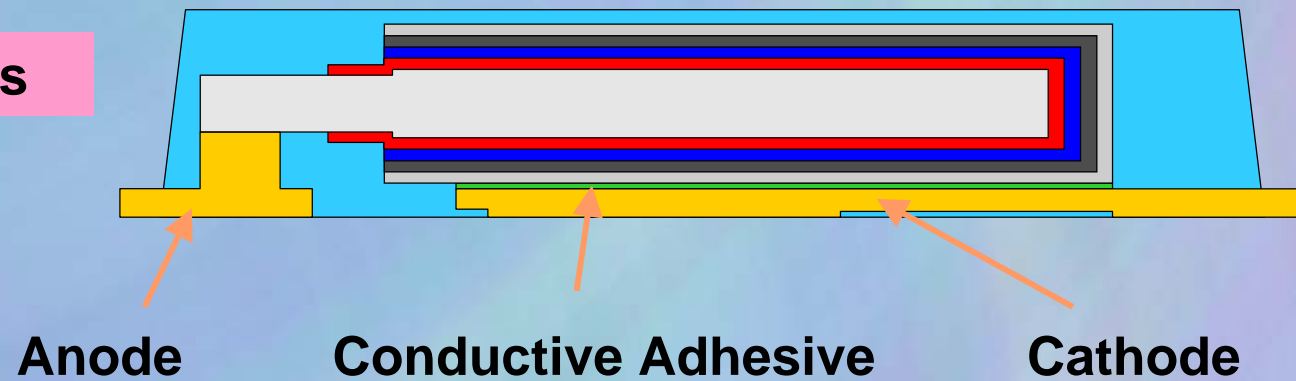
POSCAP

➤ Face down type

TPU series



TPL series



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Features of POSCAP



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Features of POSCAP



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- **Small size, Low profile, Low ESR, High allowable ripple current**

Model	Size (mm)	Capacitance (uF)	E.S.R. (mOhm)	Maximum allowable ripple current (mArms)
2R5TPD1000M5	7.3 X 4.3 X 3.6 (D4D)	1000	5	6,100
2TPSF270M9	3.5 X 2.8 X 1.9 (B2)	270	9	2,600
6TPU47MSK	2.0 X 1.25 X 1.1 (S11)	47	100	620

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Features of POSCAP



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➤ Voltage derating

- 90% of rated voltage is recommended

➔ (In case of rated voltage is more than 10WV, 80% of rated voltage is recommended)

No need to derate voltage by temperature !!

➤ Excellent reliability and long operating time

- High temperature load operation

➔ 105 deg.C x 2000hours guaranteed

In case of small case size model, 85 deg.C x 1000 hrs.)

➤ Heat resistance when soldering

- Corresponded to lead free soldering

➔ Peak Temp. 260 deg.C for twice available by SANYO recommended condition. (*except some models.)

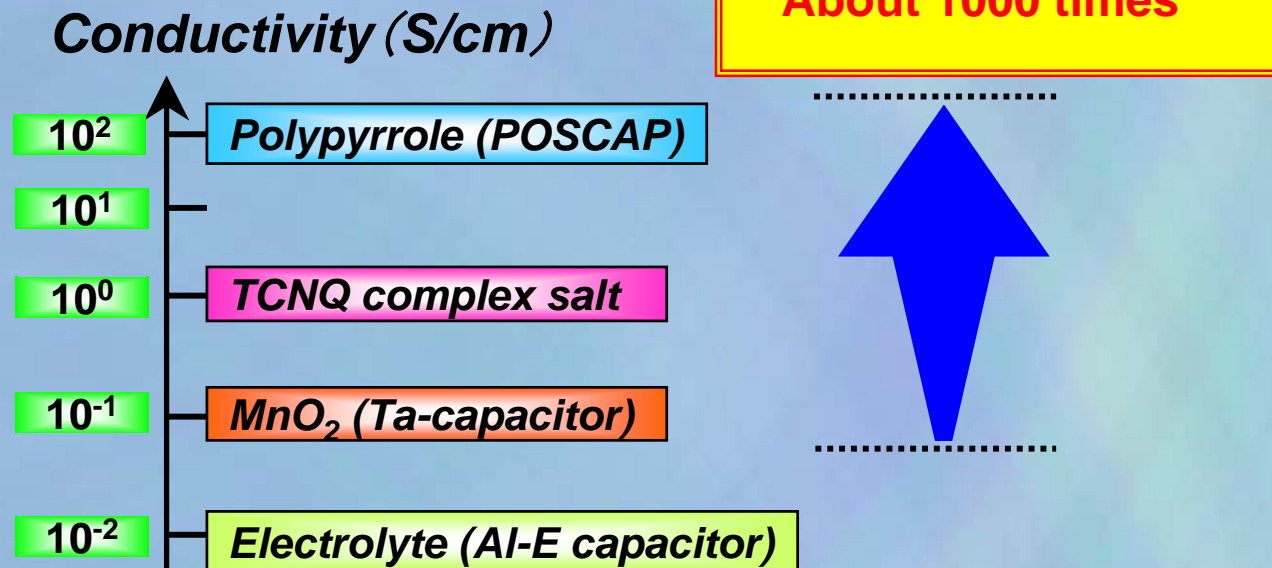
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Features of POSCAP



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➤ Polymerized electrolyte



◆ Features of Polymerized electrolyte

- High conductivity -> Very low ESR.
- High reliability at high temperature -> Extremely long operating time.
- Excellent self recovery system -> High self recovery performance compared with Ta(MnO_2)-Cap.
- Oxygen free structure -> Safer than Ta(MnO_2)-Cap in case of break down by short circuit.

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Features of POSCAP

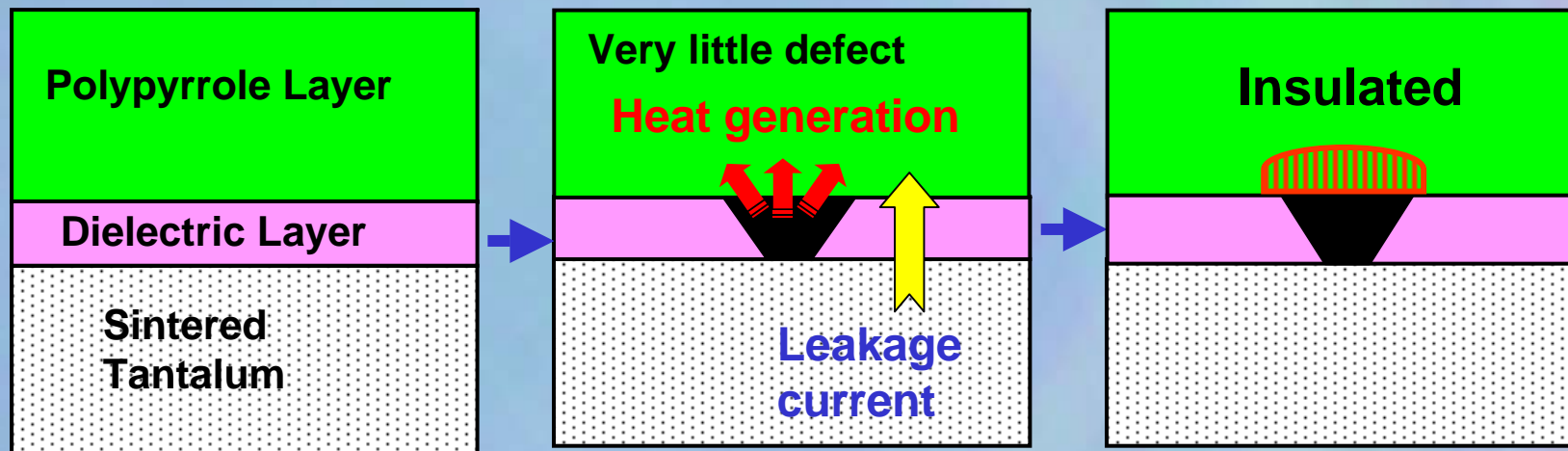


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➤ Safety Mechanism

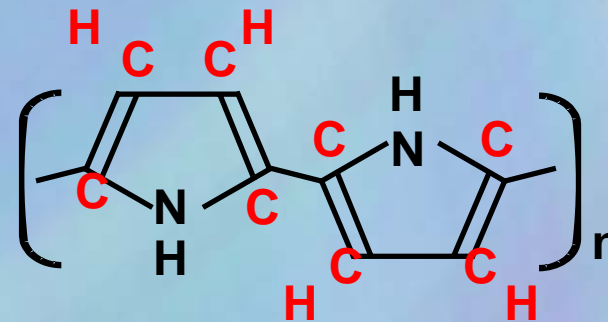
Guarantee High Rush Current by Non-Oxygen and Self-Recovery System

Self recovery system



Oxygen free structure

Polypyrrole



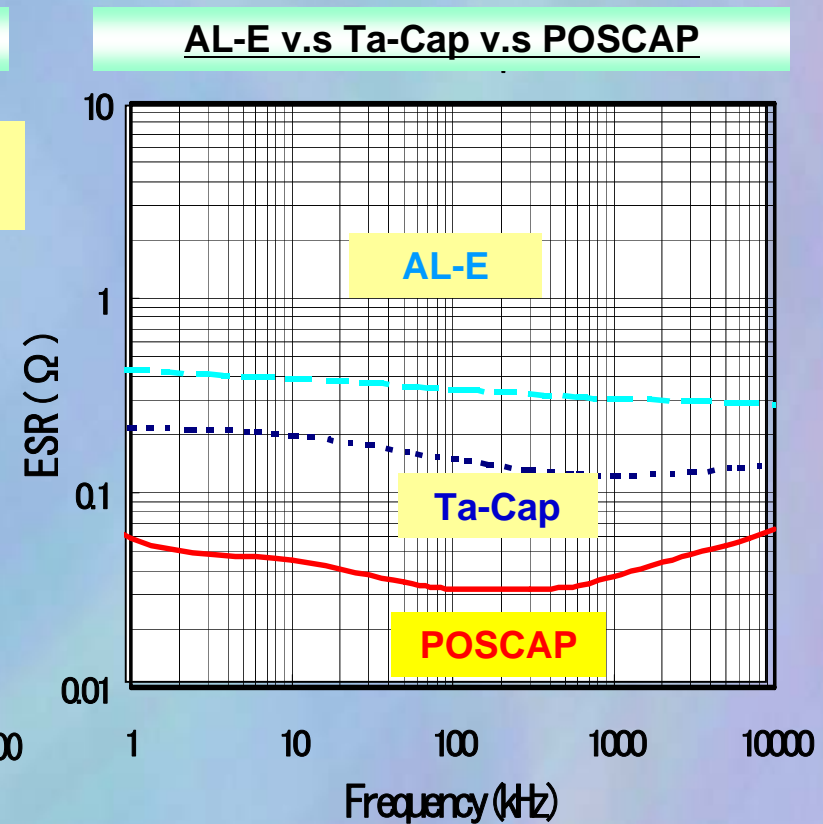
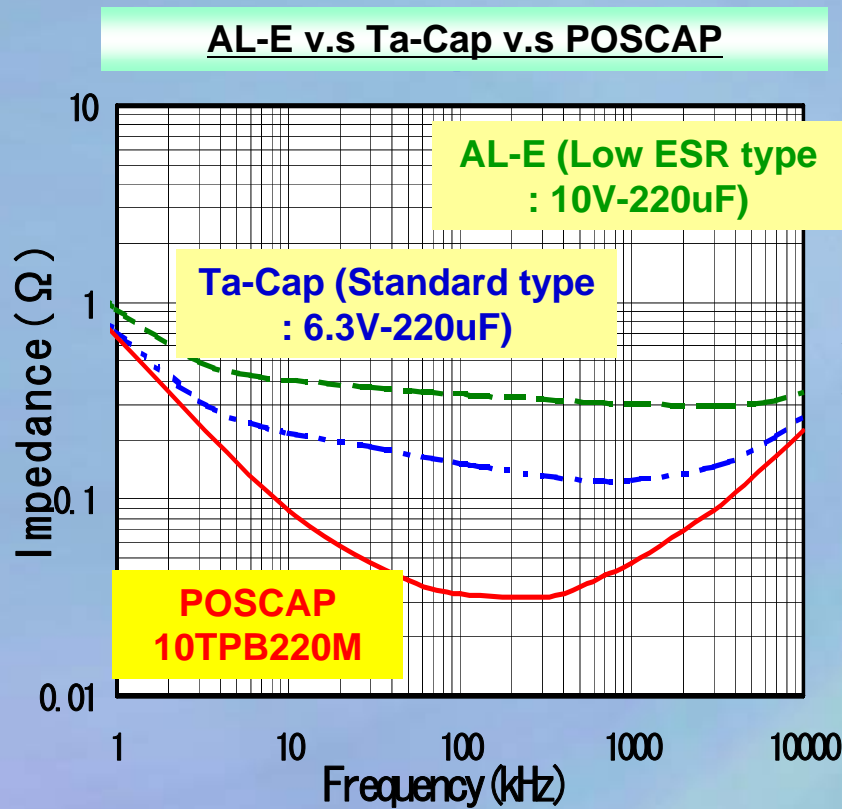
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Features of POSCAP



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➤ Frequency Characteristics



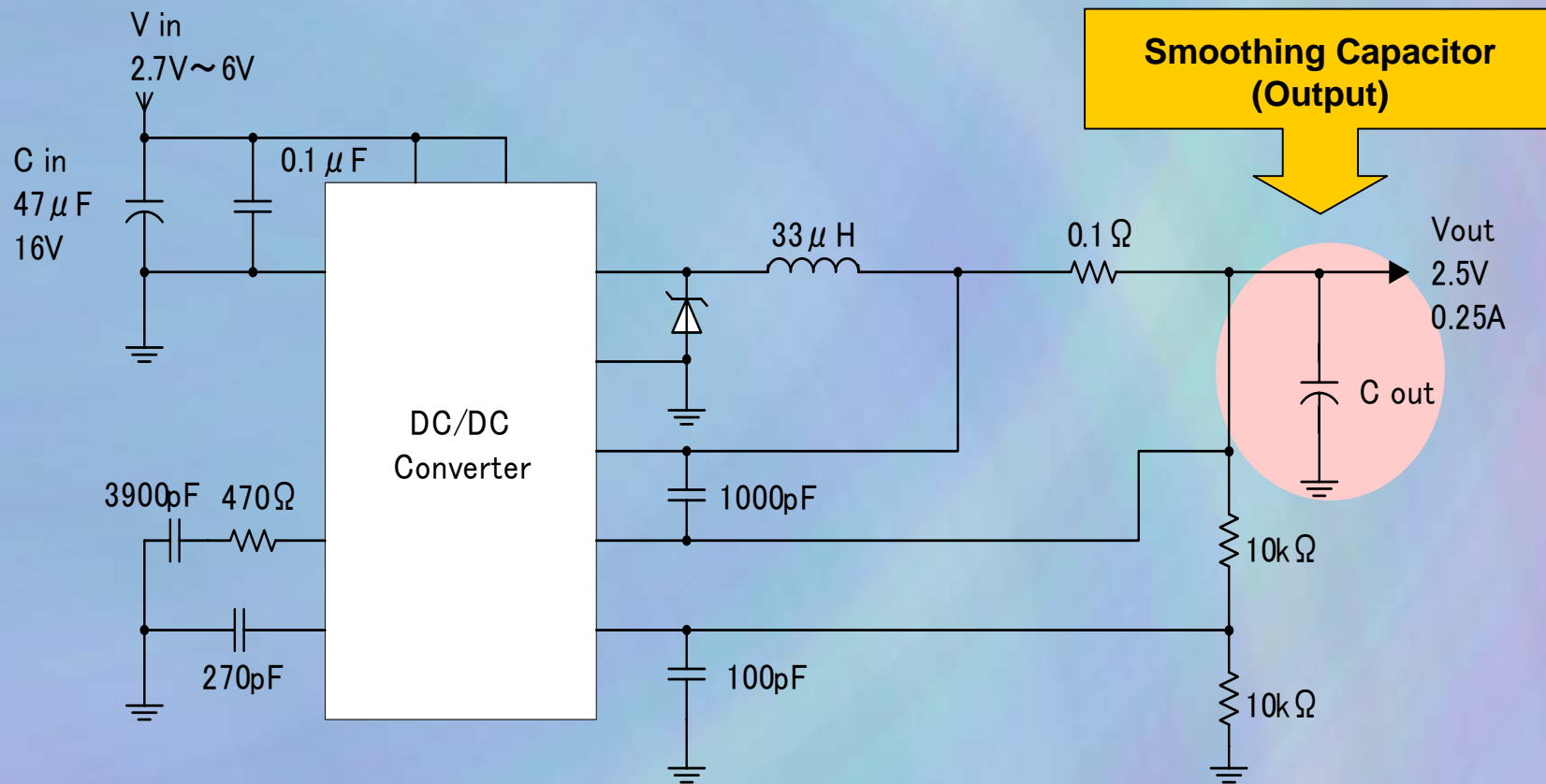
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Features of POSCAP



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➤ Comparison on evaluation board of DC/DC Converter



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Features of POSCAP



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➤ Comparison with Tantalum Cap.

POSCAP™ TPC series

6.3V-47 μ F \times 1 pcs

Size : B1 (3.5 x 2.8 x 1.1 mm)

Downsized
to 1/3

Low ESR Ta-Capacitor

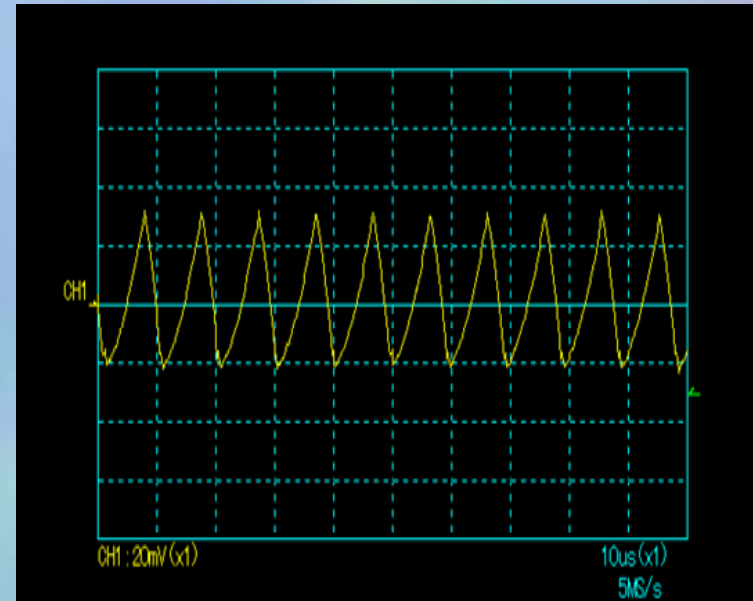
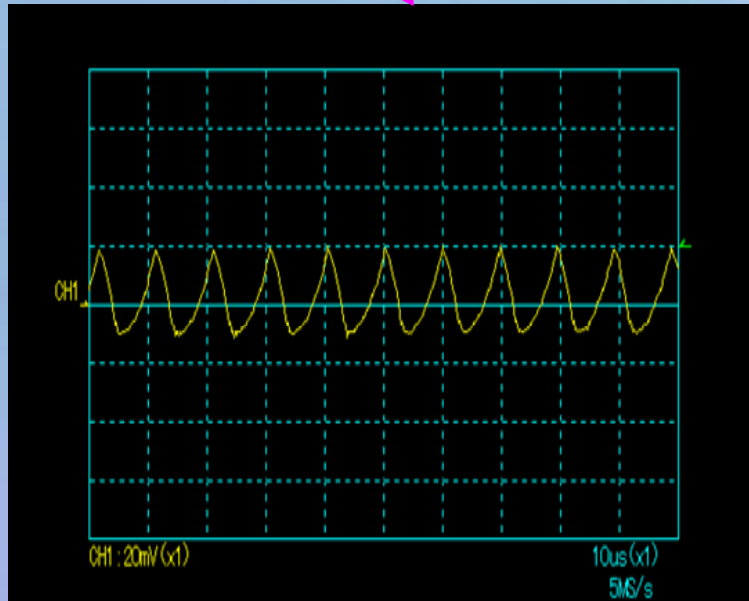
6.3V-100 μ F \times 1 pcs

Size : D (7.3x4.3x2.8 mm)

$\Delta V = 28.7\text{mV}$

Reduced to
about 1/2

$\Delta V = 54.4\text{mV}$



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Series Diagram of POSCAP



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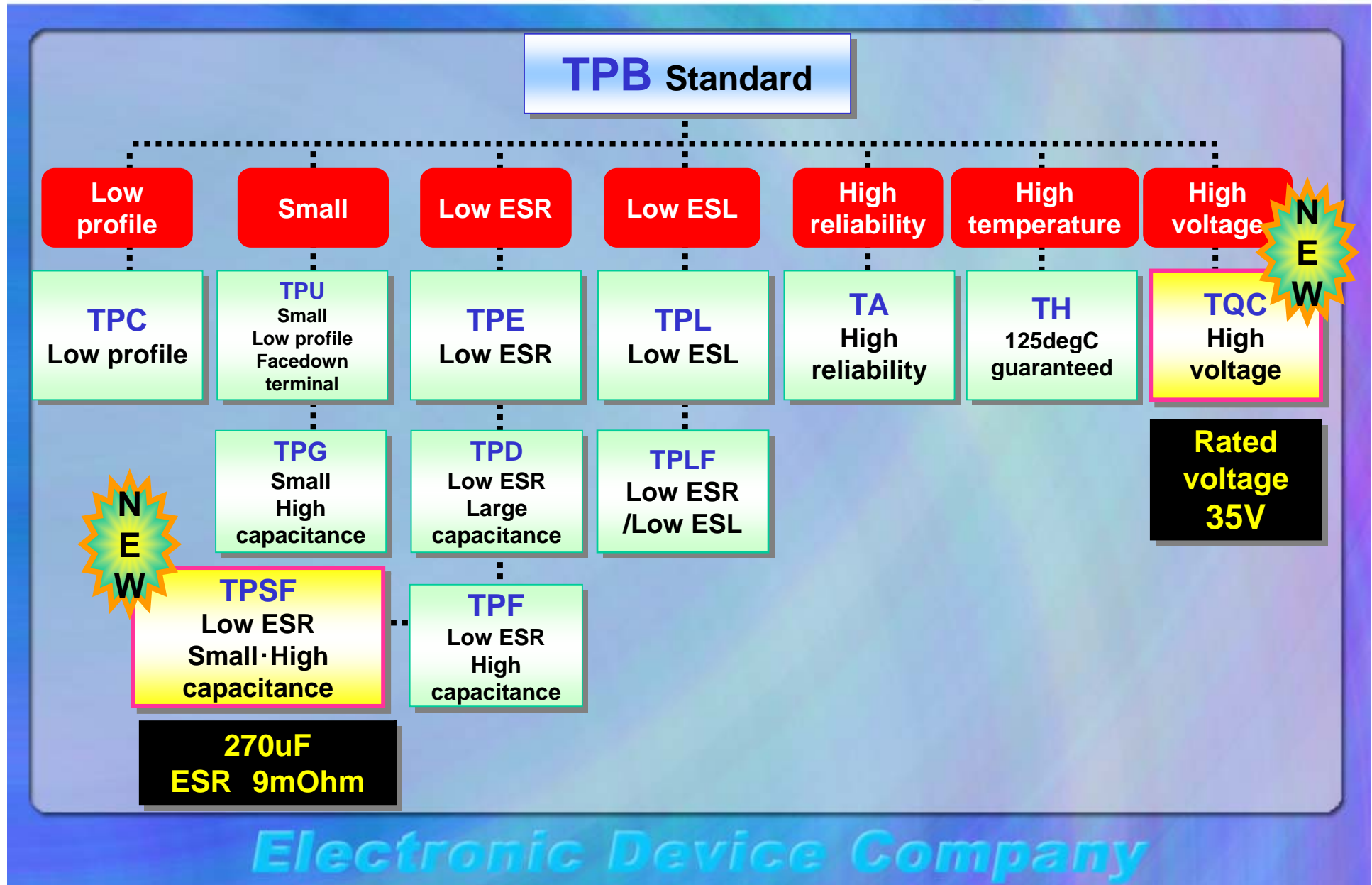
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Series Diagram of POSCAP



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THANK YOU FOR YOUR

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