

# Polymer CAPACITORS

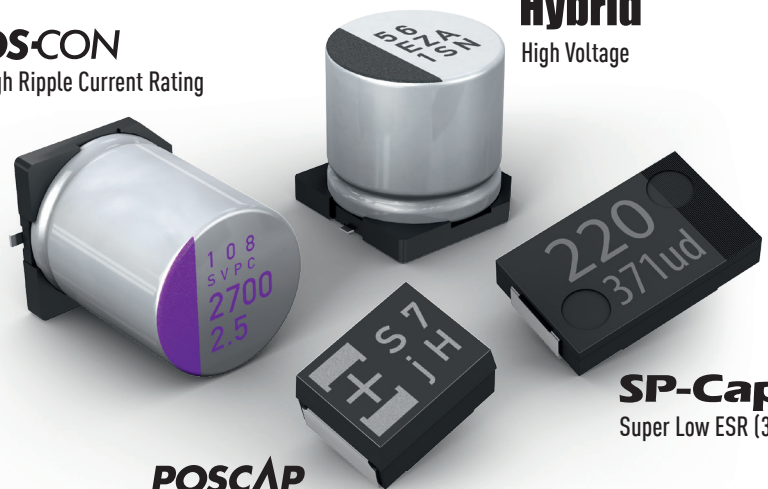
Speed up your Design – The next Stage of Low ESR

## KEY BENEFITS:

- High Miniaturization Potential
- No DC Bias Effect & No Voltage Derating
- No Capacitance Drift
- Long Lifetime & High Reliability

**OS-CON**  
High Ripple Current Rating

**Hybrid**  
High Voltage



**POSCAP**  
Small Case Sizes

**SP-Cap**  
Super Low ESR (3 mΩ)



Automotive



LED Lighting



Power Management



Smart Home

# Low ESR saves space and cost, reduces design complexity

Polymer Capacitors have excellent frequency characteristics. Thanks to their ultra-low ESR values, polymer capacitors exhibit low impedance near their resonance point which reduces AC ripple in power circuits. Polymer capacitors are also very stable, showing no capacitance drift over temperature and no DC bias - this stability simplifies the design process. Polymer Capacitors are very efficient, since they are available in very small case sizes, which significantly contributes to a compact design and cost saving.

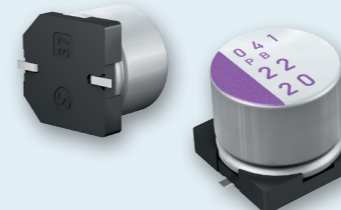
## FEATURES

	Lytic	POLYMER				MLCC	MnO2 Tantal
		Hybrid, SP-cap, POSCAP	OS-CON				
Ripple Current	medium	high	✓	high	✓	high	medium
ESR	medium	low	✓	low	✓	low	medium
Voltage Derating	no	no	✓	no	✓	not specified	yes
Capacitance (against DC Bias)	stable	stable	✓	stable	✓	decrease	stable
Capacitance (against Frequency)	decrease	stable	✓	stable	✓	stable	decrease
Capacitance (against Temperature)	unstable	stable	✓	stable	✓	decrease	stable
Estimated Lifetime	limited	long	✓	long	✓	long	long
Typical Lifetime (at 85°C)	5-7 years	10 years	✓	10 years	✓	not specified	not specified
Lifetime Calculation Formular	10°C reduction → 2x lifetime	10°C reduction → 2x lifetime		20°C reduction → 10x lifetime		Failure Rate	Failure Rate
Initial Leakage Current	low	low	✓	medium		low	low
ex.: Input, 28V line, 100kHz → capacitor requirements: 35V, 22uF, 2Arms ripple	2pcs Ø10x10.2mm	1pc 7.3x4.3x1.9mm		1pc 0.5 x 6mm		4 pcs 6.1x5.3mm	4pcs 7.3x4.3x4.3mm

# Polymer Capacitors for demanding applications

## Higher Voltage

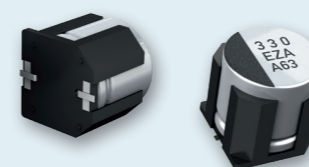
### OS-CON\*



#### High Ripple Current - High Capacitance

- Voltage Range: 2 to 100 VDC
- Capacitance Range: 4.4 to 2700 µF
- Temperature Range: -55°C/+125°C
- Endurance\*\*: 2000h at 125°C
- ESR: Down to 5 mΩ
- Ripple Current: up to 7.2Arms
- Size: Ø 4 mm to 10 mm
- Height: 5.5 mm to 13 mm

### Hybrid (Polymer & Electrolyte)



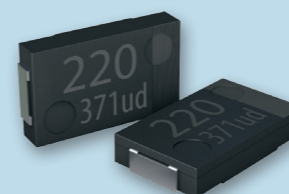
#### High Temperature - Low Leakage Current

- Voltage Range: 25 to 80 VDC
- Capacitance Range: 10 to 560 µF
- Temperature Range: -55°C/+150°C
- Endurance: 1000h at 150°C
- ESR: Down to 11 mΩ
- Ripple Current: up to 4.0 Arms
- Size: Ø 5 mm to Ø 10 mm
- Height: 5.8 mm to 16.5 mm



## Lower Height

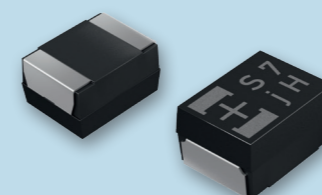
### SP-Cap



#### Super Low ESR - Low Profile - No Voltage Derating - No Ignition

- Voltage Range: 2 to 6.3 VDC
- Capacitance Range: 2.2 to 820 µF
- Temperature Range: -40°C/+125°C
- Endurance\*\*: 1000h at 125°C
- ESR: Down to 3 mΩ
- Ripple Current: up to 10.2Arms
- Size (L x W): 7.3 x 4.3 mm
- Height: 1.1 mm to 2.0 mm

### POSCAP\*



#### Small Case Sizes - High Capacitance - No Voltage Derating - No Ignition

- Voltage Range: 2 to 35 VDC
- Capacitance Range: 3.9 to 1500 µF
- Temperature Range: -55°C/+125°C
- Endurance\*\*: 1000h at 125°C
- ESR: Down to 5 mΩ
- Ripple Current: up to 4.4 Arms
- Size (L x W): 3.5 x 2.8 mm  
7.3 x 4.3 mm
- Height: 1.1 mm to 4.0 mm

\* Automotive grade product available, please contact Panasonic

# \*\*Endurance - Long lifetime & high reliability

## SP-CAP, POSCAP

125°C / 4000 h		
125°C →	4,000 h	0.5 years
115°C →	8,000 h	0.9 years
105°C →	16,000 h	1.8 years
95°C →	32,000 h	3.7 years
85°C →	64,000 h	7.3 years
75°C →	128,000 h	14.6 years

Arrhenius formula 10°C temperature reduction, lifetime is 2x longer  $L_x = L_o \times 2^{\frac{T_o - T_x}{10}}$

The above are reference examples. For detailed lifetime calculation, please contact Panasonic.

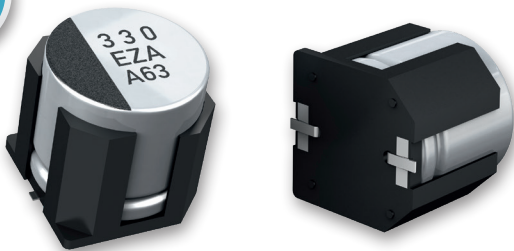
## OS-CON

125°C / 1000 h		
125°C →	1,000 h	0.1 years
105°C →	10,000 h	1.1 years
85°C →	100,000 h	11.4 years

20°C temperature reduction, lifetime is 10x longer  $L_x = L_o \times 10^{\frac{T_o - T_x}{20}}$

To : Maximum operating temperature (°C)  
 Tx : Temperature in actual use (°C)  
 Lo : Guaranteed life at maximum temperature in use (h)  
 Lx : Life expectancy in actual use (temperature Tx) (h)  
 \* With max. Ripple Current applied \*

# Anti-Vibration SMD Hybrid & Lytic Capacitors



## ANTI-VIBRATION FEATURES:

- Excellent Anti-Vibration Performance withstands 30G
- Drop-shock resistant
- No significant change when dropped from a height of 1.2 m
- Available for all SMD Hybrid & Lytic Capacitor series with ≥ Ø 6mm