

POLYMER CAPACITORS

Speed up your Design – The next Stage of Low ESR

- 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



SP-Cap

Super Low ESR (3 mΩ)

POSCAP

Small Case Sizes



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

	POLYMER				
	Lytic	Hybrid	Solid Type*	MLCC	MnO2 Tantal
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 Ø6.3x7.7mm 	1pc 7.3x4.3x1.9mm 	4 pcs 6.1x5.3mm 	4pcs 7.3x4.3x4.3mm 

* POSCAP, OS-CON

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 μ F
Temperature Range	-55°C/+125°C
Endurance**	2000h at 125°C
ESR	Down to 5 m Ω
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 μ F
Temperature Range	-55°C/+150°C
Endurance	1000h at 150°C
ESR	Down to 11 m Ω
Ripple Current	up to 4.0 Arms
Size	Ø 5 mm to Ø 10 mm
Height	5.8 mm to 16.5 mm

Anti-Vibration
Proof Versions
available

All
Products
AEC-Q200
certified

Lower Height

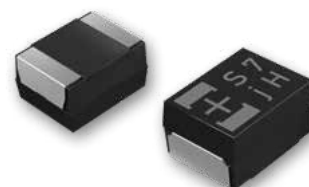
SP-Cap



Super Low ESR · Low Profile · No Voltage Derating · No Ignition

Voltage Range	2 to 6.3 VDC
Capacitance Range	2.2 to 560 μ F
Temperature Range	-40°C/+125°C
Endurance**	1000h at 125°C
ESR	Down to 3 m Ω
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 μ F
Temperature Range	-55°C/+125°C
Endurance**	1000h at 125°C
ESR	Down to 5 m Ω
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

Hybrid		
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, SP-Cap, POSCAP		
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

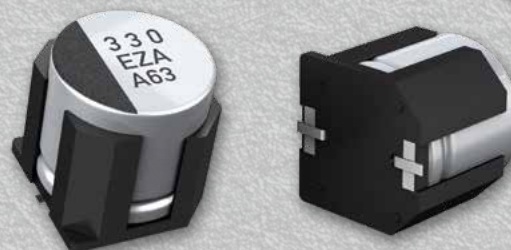
$$L_x = L_o \times 10^{\frac{T_o - T_x}{20}}$$

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 1.2m
- > Available for all SMD Hybrid & Lytic Capacitor series with $\geq \varnothing 6\text{mm}$



Panasonic
INDUSTRY



industry.panasonic.eu