

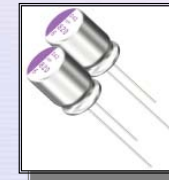
OS-CON

About OS-CON(Basic)

*SANYO Electric Co., Ltd.
Electronic Device Company*

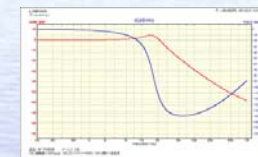
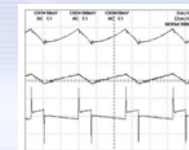
What is the OS-CON

- Structure of OS-CON
- Electrolyte of OS-CON



Features of OS-CON

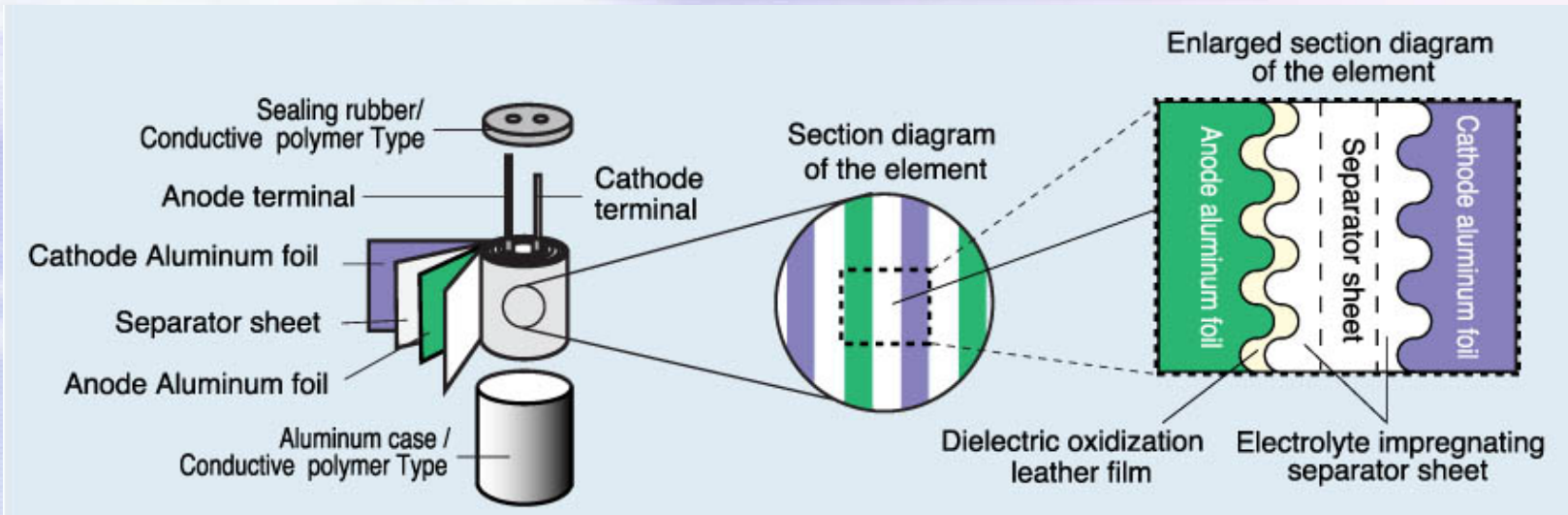
- Frequency Characteristics
- Low ESR (Impedance) Effect
- Temperature Characteristics
- Low Temperature Characteristics Effect
- Life time calculation
- Endurance test 105deg.C/5,000Hr
- Filter Circuit



What is the OS-CON



➤ OS-CON's Structure



OS-CON's structure is very similar to Al-E. Difference is Electrolyte

■ OS-CON	Solid
■ Al - E	Liquid

What is the OS-CON



➤ Electrolyte

- Organic Semiconductor (TCNQ complex Salt)
- Conductive Polymer (Polythiophene)

Type of Capacitor	Type of Electrolyte	•Conductivity (mS/cm)
Non-solid electric Capacitor	Electrolyte solution	3
Solid electronic Capacitor	Manganese dioxide	30
OS-CON	•TCNQ complex salt	300
	Conductive Polymer	3,000

Approximate Value

➤ Feature of the Electrolyte

- High conductivity compared other electrolyte
 - ➔ **Low ESR!!!**
- High conductivity provides stability against temperature
 - ➔ **ESR does not change at low temperatures !!!**

Features of OS-CON

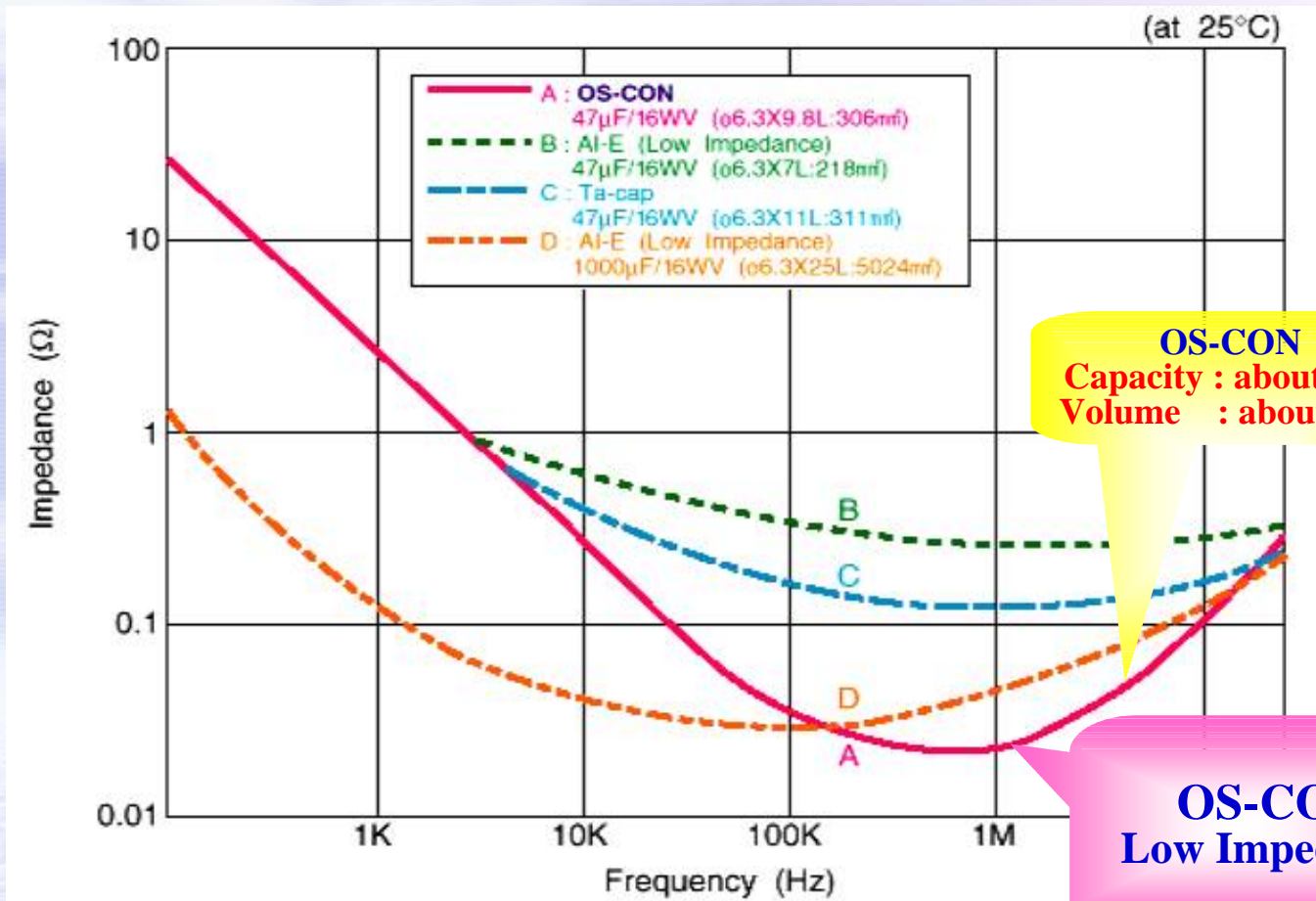
OS-CON

- Frequency Characteristics
 - Compared to other kinds of capacitors-*
- Low ESR (Impedance) Effect
 - Compared to Al capacitors in a DC/DC converter-*
- Temperature Characteristics
 - 55 deg.C to 105 deg.C*
- Low Temperature Characteristics Effect
 - Low temperature characteristics in a DSC-*
- Life time calculation
- Endurance test
 - 105deg.C/5,000Hr*
- Applications

Features



➤ Frequency Characteristics



OS-CON
Capacity : about 1/20
Volume : about 1/15

OS-CON
Low Impedance

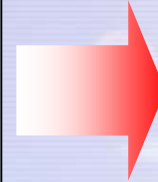
Features -Low ESR-

OS-CON

➤ DC/DC converter

Condition

Sw IC : ROHM 200kHz
 Input Voltage : 5V(V_{in})
 Output Voltage : 3.3V(V_{out})
 Output ripple voltage(V_{ripple}) : 20mV
 Output current(I_{out}) : 3.2A
 L : 10uH



$$ESR < \frac{V_{ripple}}{\frac{V_{in} - V_{out}}{L} \times \frac{V_{out}}{V_{in}} \times \frac{1}{f_{osc}}}$$

< 35.7 m ohm

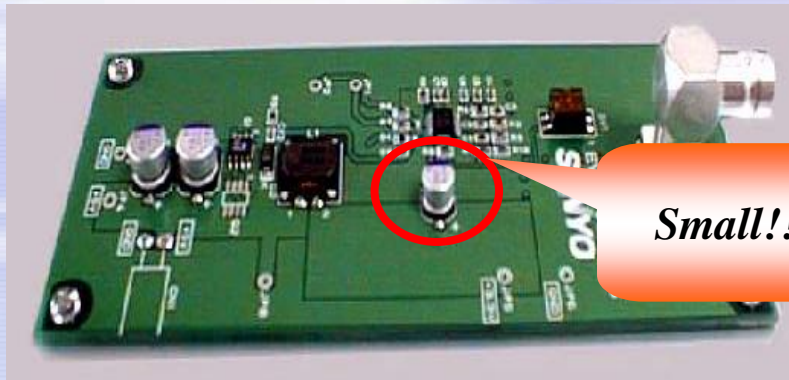
Following Capacitors have been selected

- OS-CON → 6SVP100M 1p
 Φ 6.3mm X L6mm, ESR = 32m ohm
- Aluminum Electrolytic Capacitor → 6V/680uF 3p
 Φ 10mm X L8mm, ESR = 128m ohm TTL ESR = 43m ohm

Features -Low ESR-



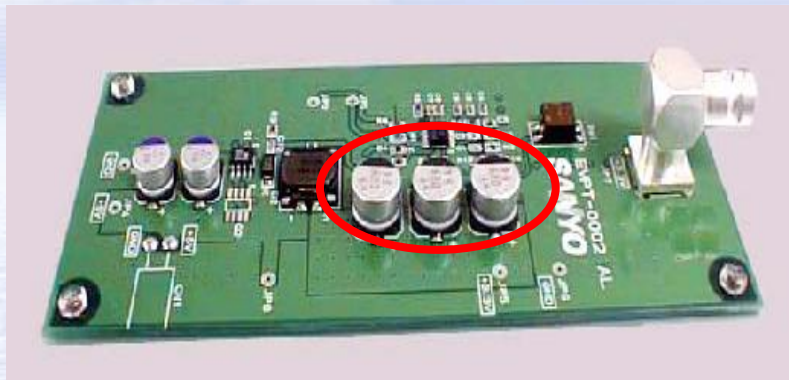
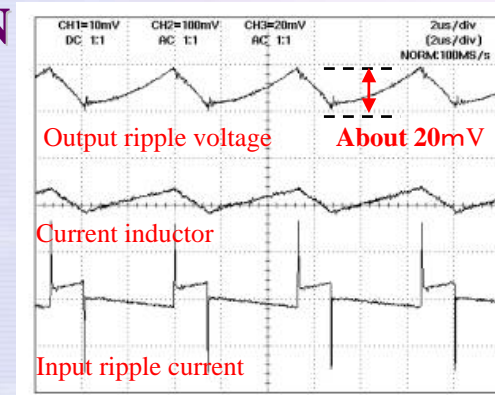
➤ You can place just ONE **LOW ESR OS-CON** to the Al-Cap



OS-CON

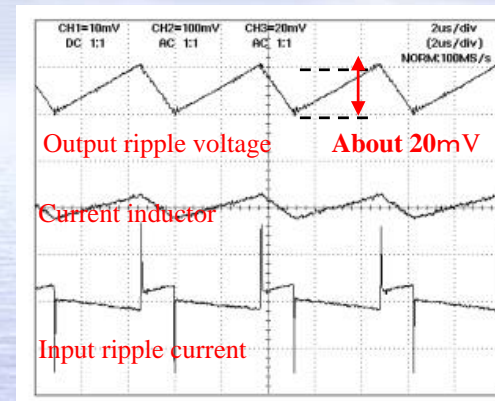
Small!!!

OS-CON 6SVP100M 1p.



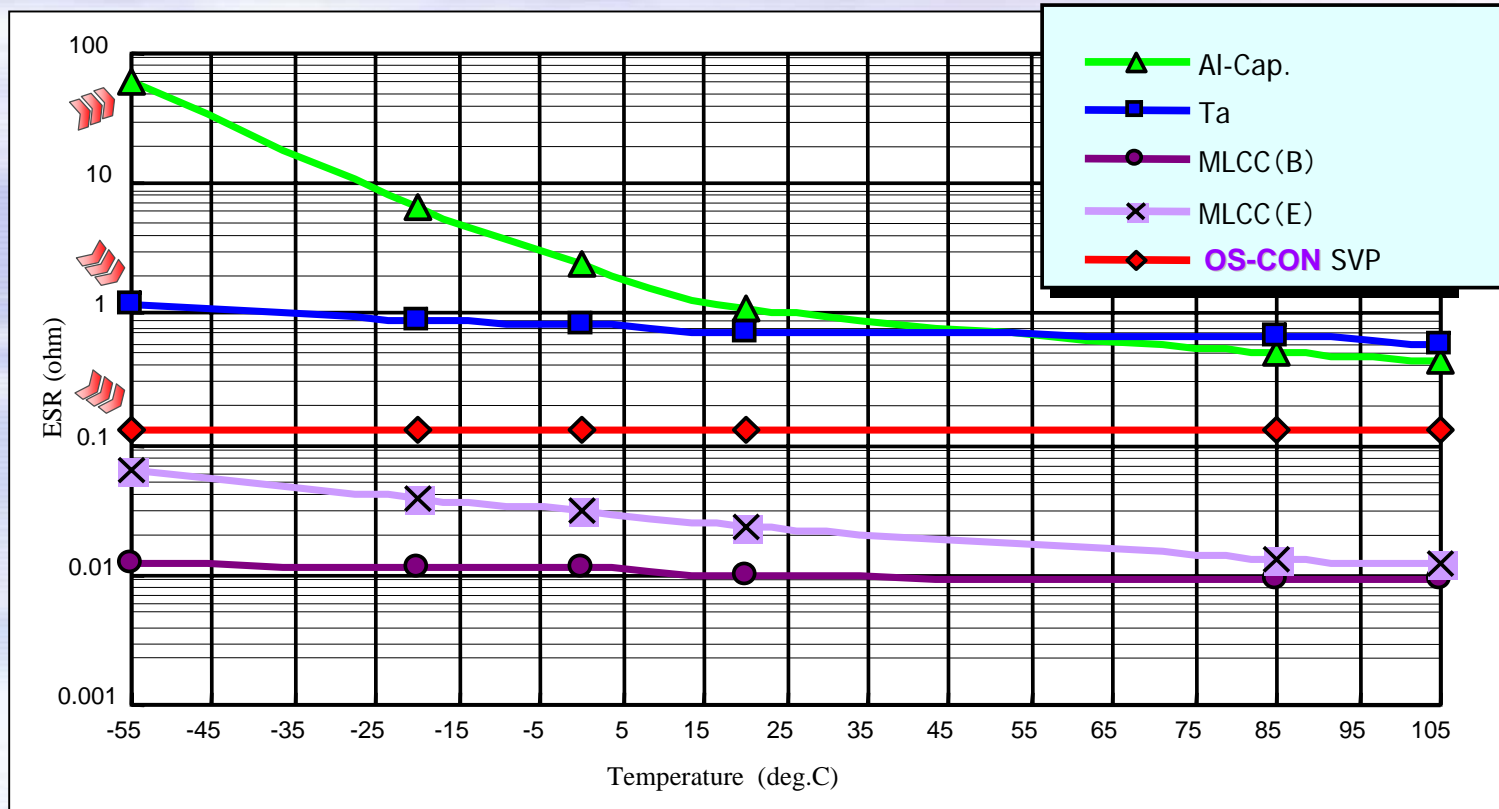
Al-Cap.

Al-Cap 6V/680uF 3p.



Features -Temperature-

➤ Temperature Characteristic (-55 ~105 deg.C)



ESR does not change with the temperature!!!

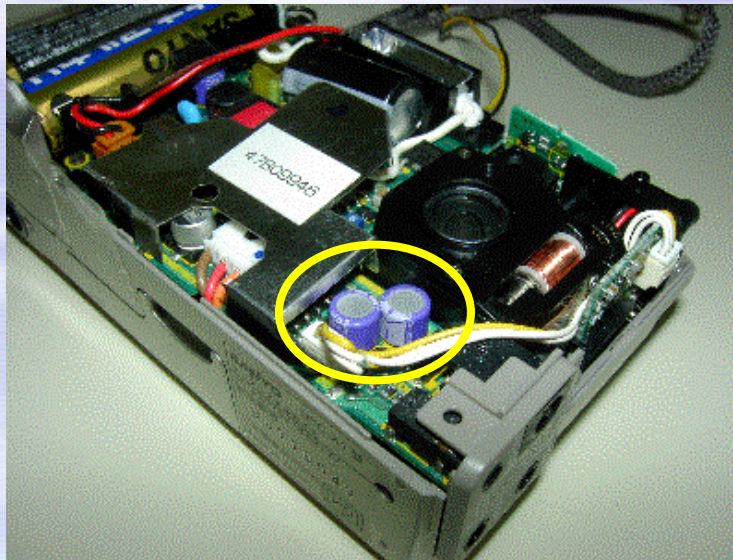


OS-CON is suitable for outdoor equipments

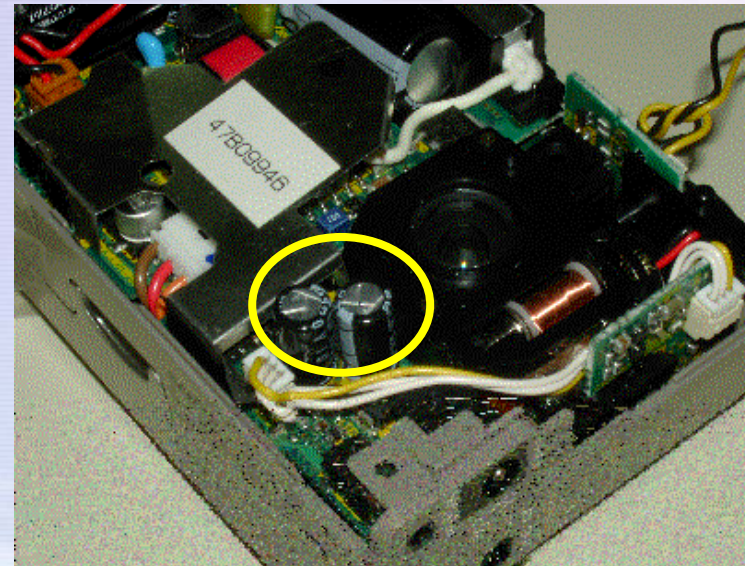
Features –Temperature–

OS-CON

- A DSC picture with **OS-CON** and Al-Capacitors



OS-CON
10SL47M(2p)
Φ 6.3mm × L5.0mm



Al-Cap.
10V/330uF(2p)
Φ 6.3mm × L11.0mm

Features -Temperature-

OS-CON

OS-CON



Al-Cap.



★ OS-CON works from -20deg. C to 25 deg. C, while Al-Cap's does not work at low temperature as seen in the picture above.



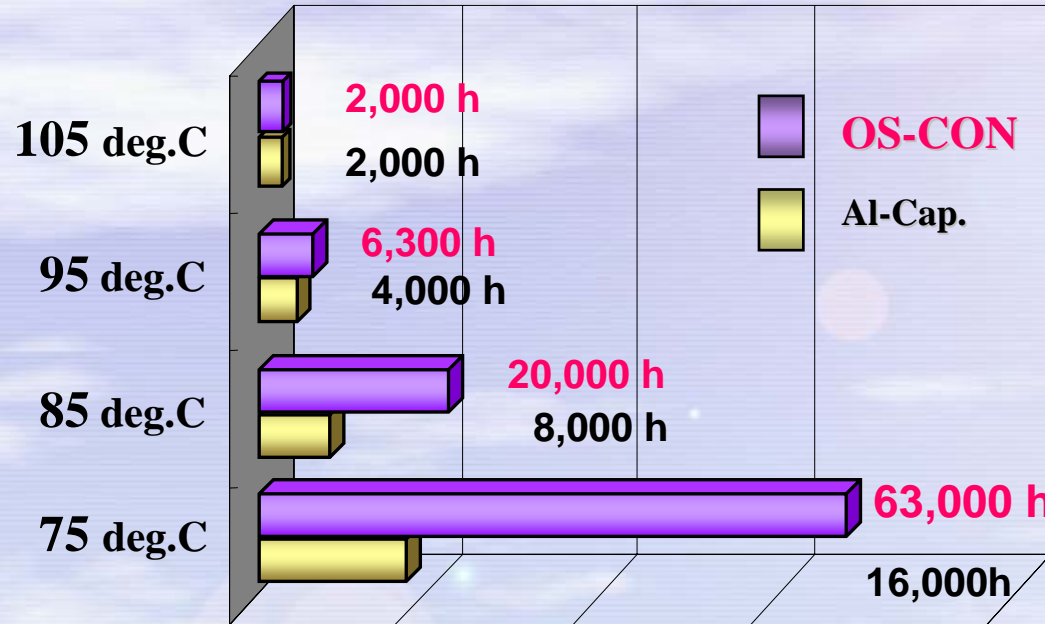
OSCON no need to consider degradation at low temperature

Features

-Life time-

OS-CON

➤ *Lifetime calculation*



AI-E

10°C reduction
Arrhenius's law

2 times longer

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

- Lx: Life expectance (h) in actual use (temperature Tx)
- Lo: Guaranteed (h) at maximum temperature in use
- To: Maximum operating temperature
- Tx: temperature in actual use (ambit temperature of OS-CON)

20 deg.C reduced

↓

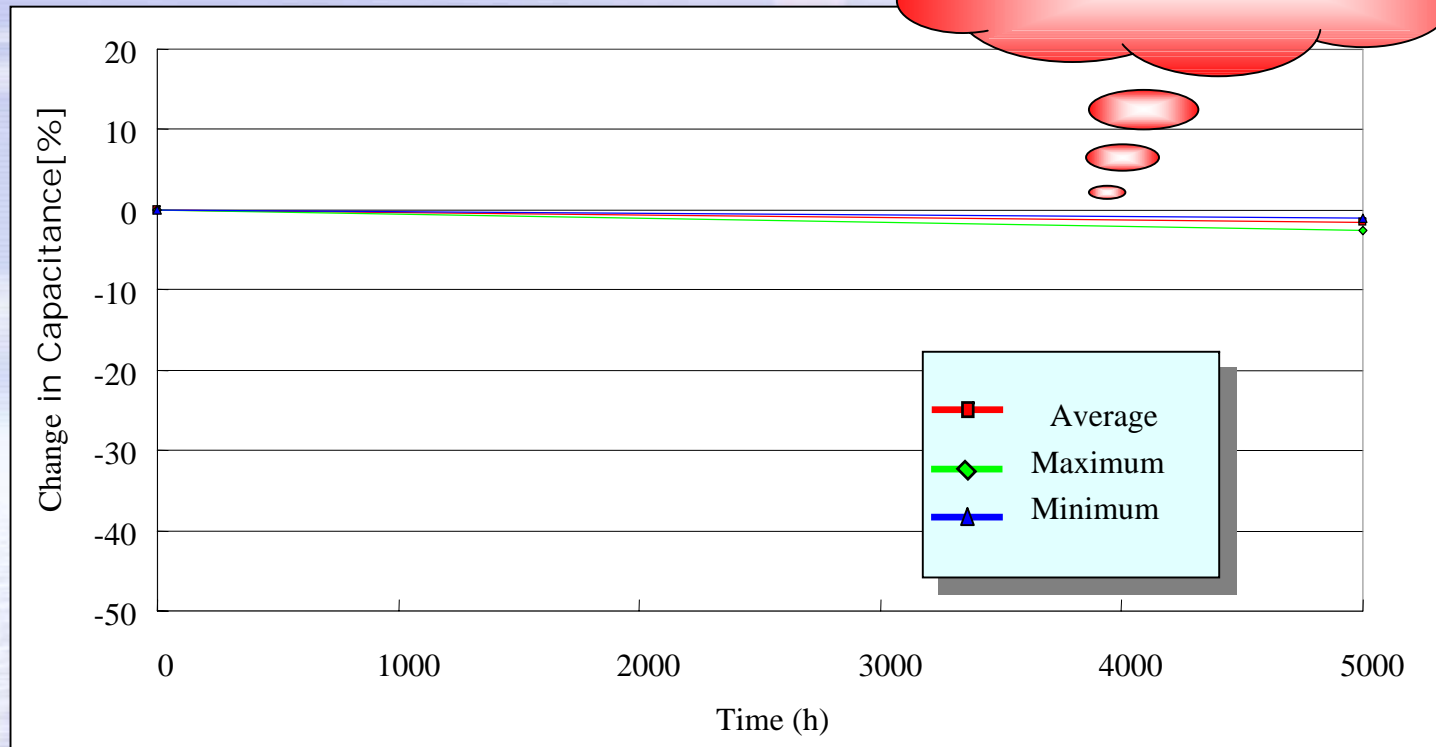
10 times longer

Features -Endurance-

➤ Endurance (105 deg.C, 20V, 5000Hr)

Model : 20SVP33M (E7 size)
Q'ty : n = 20pcs.
Condition :105 deg.C × 20V × 5000h

Non Dry-up!!!



Applications



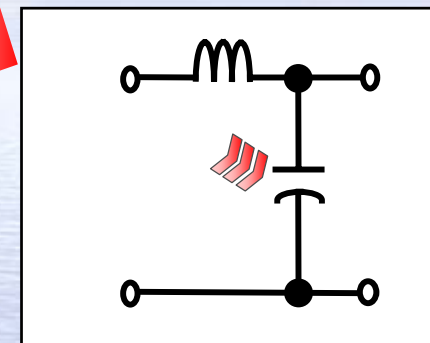
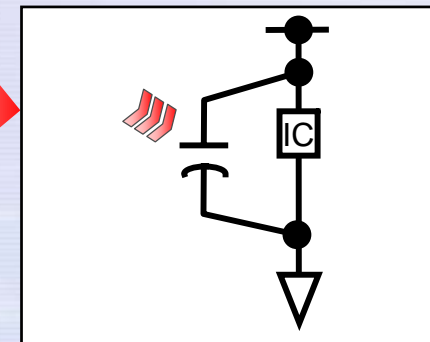
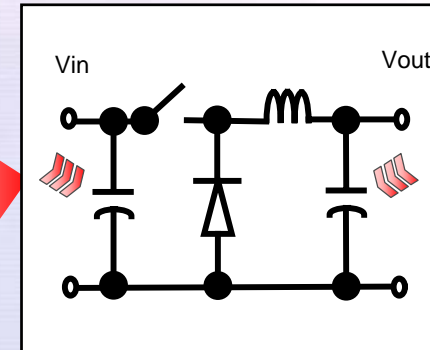
➤ Application of OS-CON

▪ Power supply for smoothing capacitor

▪ for Back-up

▪ for By-pass

▪ for Low-pass filter circuits



Thank you for your attention