

Characteristics Comparison: Aluminum Electrolytic vs. Hybrid Capacitors

■ Characteristics of Hybrid Capacitors: Ripple Current

Higher ripple current capability compared to standard aluminum electrolytic capacitors.

Case 1) Comparison with the Same Voltage Rating and Case Size

Aluminum SMD	
Rated voltage	25V 330uF
Case size	φ10x10L
Ripple current	500mArms
ESR	0.15Ω
Temperature	125°C
Lifetime	2000h

Polymer Hybrid: HVK Series		Advantages
Rated voltage	25V 330uF	
Case size	φ10x10L	
Ripple current	2000mArms	4x Higher
ESR	0.02Ω	1/7 of Conventional ESR
Temperature	125°C	
Lifetime	4000h(6000h)	2-3x Longer Life

Case 2) Replacement Based on Equivalent Ripple Current

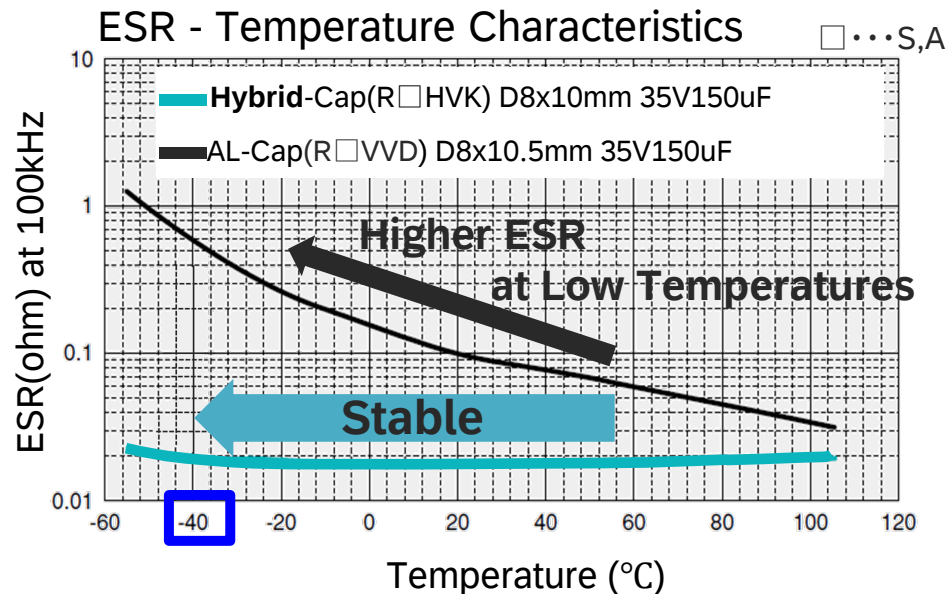
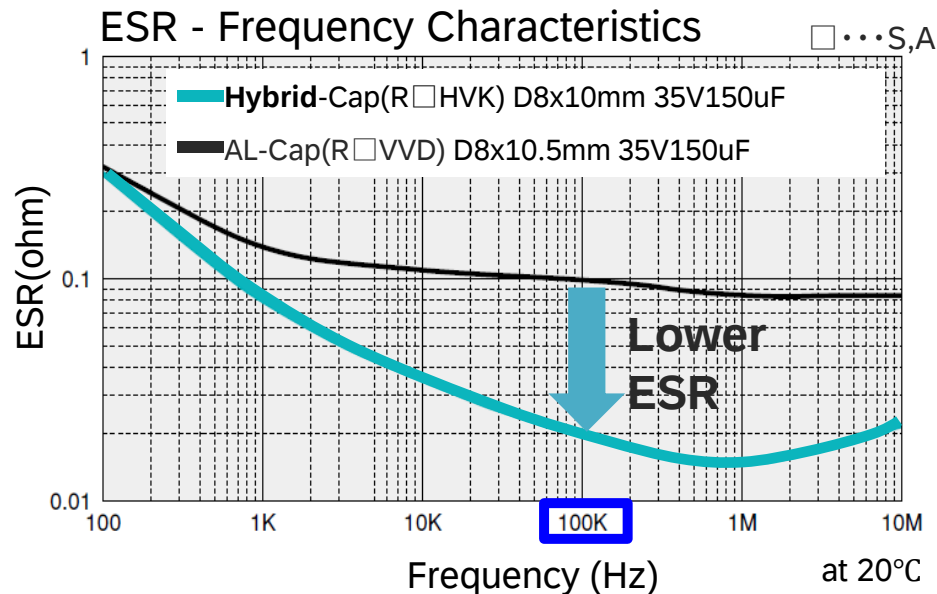
Aluminum SMD	
Rated voltage	25V 2200uF
Case size	φ18x21.5L
Ripple current	1550mArms
ESR	0.042Ω
Temperature	125°C
Lifetime	5000h

Polymer Hybrid: HVK Series		Advantages
Rated voltage	25V 220uF	Smaller Capacitance Required
Case size	φ8x10L	80% Reduction
Ripple current	1600mArms	
ESR	0.027Ω	1/1.6 of Conventional ESR
Temperature	125°C	
Lifetime	6000h	1.2x Longer Life

The major advantage of using hybrid capacitors is their high ripple current capability. When replacing standard aluminum electrolytic capacitors, this allows for **downsizing**, **a reduced component count**, and **a smaller mounting area**.

Hybrid Capacitor Features: Comparison with Aluminum & Polymer Capacitors

Low ESR and Excellent ESR Stability over Temperature



Stable Leakage Current (LC) After Thermal Shock

