

Lightweight Multilayer Polymer (MLP) Capacitors Reduce Payload for Space Missions

A Stable, Robust Alternative to Ceramic Capacitors Offering High-Reliability and SWaP savings

Quantic Paktron's Angstor® and Capstick® Multilayer (MLP) stacked film capacitors provide an ideal alternative to ceramic capacitors and offer the following key advantages.

Comparison of MLP technology v. X7R Ceramic

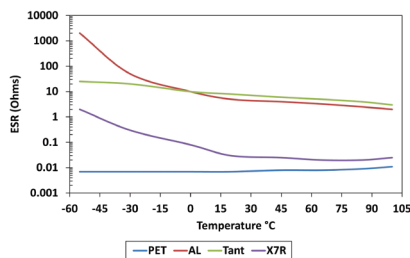
Multilayer Polymer Film [MLP]	X7R Ceramic [MLC]
✓ Stable under voltage	Cap drops 40% at 100 volts bias
✓ Stable under AC voltage	DF increases with AC voltage
✓ Chip is plastic with good TCE	Ceramic body cracks easily
✓ Stable over temperature	DF increases at low temperature
✓ No aging mechanism	Cap drops per decade hour
✓ Resilient under thermal shock	Ceramic body cracks easily
✓ Self-clearing thin electrodes	Thick film electrodes fail short
✓ Stable under mechanical stress	Piezoelectric voltage sensitive
✓ Ultra Low ESR	Low ESR
✓ Dissipation Factor ≤ 1%	Dissipation Factor ≤ 2.5%



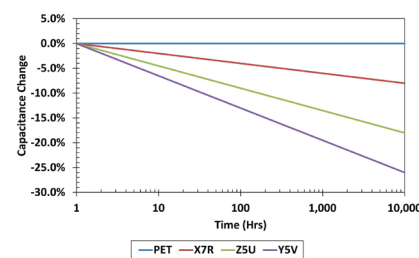
TYPICAL CHARACTERISTICS

The following graphs contrast important characteristics of MLP Capsticks to MLC ceramic units in typical, dynamic converter conditions. The electrical stability of the MLP capacitor is clear.

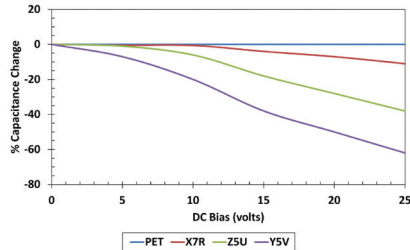
ESR vs. Temperature



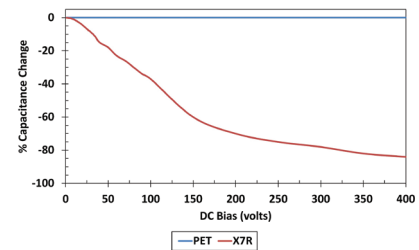
Ceramic & PET Film Capacitor Aging



% Cap Change vs. DC Bias



% Cap Change vs. DC Bias



- Weighs <25% of equivalent MLCC
- -55°- 125°C operating temperature range
- SMD options available
- Meets MIL-202 requirements
- Ultra Low ESR/ESL
- Highest Ripple Current x CV Ratings in industry
- Rugged Construction
- Voltage Ranges 50- 500VDC 630-1200 [coming soon]
- Cap. Range .1uF to 20uF

About Quantic® Paktron — Quantic® Paktron is one of the oldest capacitor manufacturers in the U.S., a technological leader in multilayer polymer film (MLP) capacitors. Its innovative portfolio addresses mission-critical, "cannot-fail" performance in demanding markets from automotive and commercial to military, space, and telecom. Its branded capacitor products include Capstick® Capacitor (lead-frame capacitor), Surfilm® Capacitor (surface mount chip capacitor), Quencharc® Capacitor (RC networks rubber capacitor), and the Angstor® Capacitor line.