Where Capacitors Impact

Commercial Avionics Systems



Evans GROUP

Power.
Precision.
Mission Life.

Technology Key

Evans: Hybrid Wet Tantalum

Paktron: Multilayer Polymer Film (stacked)

UTC: High-reliability Ceramic

Eulex: RF & High-frequency Ceramic

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For illustrative purposes only. Tool architectures, operating conditions, and applications vary. Subsystem locations shown are representative and may vary by service and tool configuration. Product placement identifies potential areas of applicability and does not imply that Evans Group supplies, is qualified on, or is installed in every platform, tool, or subsystem shown.

1. Power Generation & Ground Charging

CAPACITOR FUNCTIONS

- Starter-generator filtering
- Ground-charge input conditioning
- AC/DC and DC/DC conversion
- Bus ripple suppression
- Inrush and surge control



BEST FIT TECHNOLOGIES

Evans: Compact hold-up and pulse support for generation and charging controls

Paktron: Self-healing, high-ripple current ratings, and rugged construction for shock, vibration, and temperature extremes

UTC: Low-ESL decoupling for charger, generator, and control electronics

2. High-Voltage Conversion & Distribution

CAPACITOR FUNCTIONS

- HV DC-link filtering
- Primary/secondary bus decoupling
- Point-of-load stabilization
- EMI/RFI filtering
- Load-step transient support



BEST FIT TECHNOLOGIES

Evans: Bulk energy storage and transient energy for flight-critical buses

Paktron: Stable capacitance under DC bias with self-healing construction

UTC: Low-ESL bypass, decoupling, and high-frequency filtering

3. Energy Storage & Hold-Up

CAPACITOR FUNCTIONS

- Propulsion-energy buffering
- Peak-power support
- Voltage-droop control
- Emergency bus hold-up
- Regenerative-energy capture



BEST FIT TECHNOLOGIES

Evans: High energy and power density for compact hold-up and peak loads

Paktron: High dv/dt and low ESL for pulsed-energy storage and delivery

UTC: High-voltage pulse support and local low-inductance decoupling

4. Electric Propulsion & Motor Drives

CAPACITOR FUNCTIONS

- Inverter DC-link filtering
- Motor-commutation suppression
- Gate-drive rail decoupling
- Regenerative transient control
- Resolver/sensor filtering



BEST FIT TECHNOLOGIES

Evans: Pulse and ride-through support for propulsion-control electronics

Paktron: High ripple-current ratings, high capacitance, and 1,200+ VDC options

UTC: Low-ESL decoupling for controllers, sensors, and gate drives

5. Flight Controls & Actuation

CAPACITOR FUNCTIONS

- Electromechanical actuator filtering
- Servo-drive transient suppression
- Position-sensor decoupling
- Control-loop stabilization
- Emergency actuation hold-up



BEST FIT TECHNOLOGIES

Evans: High energy density power hold-up for flight-critical actuator loads

Paktron: DC-link filtering and high-voltage options for motor drives, including BLDC systems

UTC: Precision low-ESL filtering for sensors/control electronics

6. Avionics, Navigation & Autonomy

CAPACITOR FUNCTIONS

- Processor/FPGA decoupling
- IMU/GNSS sensor filtering
- Timing/reference stability
- Memory and safe-state hold-up
- High-speed I/O noise control



BEST FIT TECHNOLOGIES

Evans: Backup and hold-up for flight computers and safe-state control

Paktron: Thermal stability and low ESL for avionics timing and filtering circuits

UTC: Low-ESL decoupling for processors, timing, and data conversion

Eulex: High-frequency bypass and clock/signal coupling

7. Communications, Radar & Cabin Electronics

CAPACITOR FUNCTIONS

- RF matching and tuning
- DC blocking and coupling
- Weather-radar pulse support
- Radio/cabin-system decoupling
- Passenger-power filtering



BEST FIT TECHNOLOGIES

Evans: Low ESR, high energy density solution to minimize voltage droop

Paktron: Lightweight EMI filtering, ruggedized for shock, vibration, and temperature extremes

UTC: Low-ESL decoupling for radios, radar, and cabin electronics

Eulex: Low-loss matching, coupling, DC blocking, and RF filtering

8. Thermal Management & Environmental Control

CAPACITOR FUNCTIONS

- Pump and fan-drive filtering
- Compressor/inverter DC-link support
- Valve and sensor decoupling
- Motor transient suppression
- Critical cooling hold-up



BEST FIT TECHNOLOGIES

Evans: Bulk energy storage

Paktron: Ultra-low DF and high thermal stability across wide operating-temperature ranges

UTC: Low-ESL decoupling for sensors, valves, control electronics

THE EVANS GROUP ADVANTAGE

High Energy Density
Compact stored energy and hold-up for mass- and volume-constrained aircraft.

Electrified Propulsion
Low ESR and high ripple current capabilities to support inverters and motor drives.

Avionics & RF Performance
Low-ESL decoupling, matching, coupling, and filtering for flight electronics.

Aerospace Reliability
Capacitor technologies for high voltage, vibration, thermal cycling, and long service life.