

Where Capacitors Impact

Oil & Gas Downhole Systems



Evans GROUP High Temperature.
High Shock.
Reliable Power.

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. Wireline Logging & Formation Testing



CAPACITOR FUNCTIONS

- Sensor and probe power support
- Precision analog filtering
- Pump and valve actuation
- Tool-bus decoupling
- Data-memory hold-up
- HPHT shock/vibration stability

BEST FIT TECHNOLOGIES

Evans: Compact energy storage for wireline sensors, pumps, and actuators up to 200°C

UTC: High-temperature decoupling and precision filtering near measurement electronics

Eulex: Low-loss coupling and matching for propagation, resistivity, and high-frequency measurement channels



2. MWD/LWD Sensing & Telemetry



CAPACITOR FUNCTIONS

- Inclination/azimuth sensing
- Gamma, resistivity, and acoustic tools
- Mud-pulse, EM, and wired telemetry
- Real-time data acquisition
- Clock/reference stability
- Load-step and pulse support

BEST FIT TECHNOLOGIES

Evans: High-temperature/high-current pulse support for measurement and telemetry electronics

UTC: Low-ESL decoupling and filtering for sensors, processors, and telemetry interfaces

Eulex: Low-loss matching, coupling, DC blocking, and bypass for high-frequency measurement links



3. Rotary-Steerable & Directional Drilling



CAPACITOR FUNCTIONS

- Steering-actuator pulse power
- Motor and valve-drive filtering
- Closed-loop control decoupling
- Position/force sensor filtering
- Transient suppression
- Severe shock and vibration survival

BEST FIT TECHNOLOGIES

Evans: Power-dense energy storage for steering actuators and high-transient loads in extreme shock and vibration environments

Paktron: Drive filtering and snubbing in temperature-compatible electronics zones

UTC: High-temperature decoupling and filtering for steering controls and sensors



4. Downhole Power Generation & Hold-Up



CAPACITOR FUNCTIONS

- Turbine/alternator rectifier filtering
- Battery-input filtering
- DC/DC converter filtering
- DC-bus stabilization
- Ride-through and hold-up
- Inrush/load-step support

BEST FIT TECHNOLOGIES

Evans: High-temperature bulk energy storage and ride-through in narrow downhole tool housings

Paktron: Low-ESR input/output filtering and snubbing where the operating-temperature envelope permits

UTC: Point-of-load decoupling and high-frequency converter filtering



5. Formation Evaluation & Sensor Front Ends



CAPACITOR FUNCTIONS

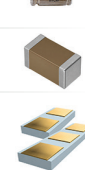
- Resistivity/induction transmit pulses
- Acoustic transmitter drive
- Receiver and ADC filtering
- RF matching and coupling
- DC blocking and bypass
- Low-noise reference filtering

BEST FIT TECHNOLOGIES

Evans: Compact energy storage and pulse power for downhole electronics

UTC: High-temperature, low-ESL decoupling and precision analog filtering

Eulex: Low-loss matching, coupling, DC blocking, and high-frequency bypass in measurement front ends



6. Downhole Computing, Timing & Memory



CAPACITOR FUNCTIONS

- Processor/FPGA decoupling
- Clock and reference stability
- ADC/DAC rail filtering
- Data-memory hold-up
- Sensor-fusion power integrity
- High-temperature reliability

BEST FIT TECHNOLOGIES

Evans: Backup and hold-up energy for critical processing, memory, and controlled shutdown

UTC: High-temperature decoupling and precision filtering for processors and data converters

Eulex: Low-ESL bypass and high-frequency filtering for clock and high-speed signal circuits



7. Completion, Perforating & Actuation



CAPACITOR FUNCTIONS

- Electric ICV and valve actuation
- Permanent-gauge power
- Packer/sleeve setting energy
- Perforating firing-energy storage
- Two-way digital telemetry
- Long-duration dormant reliability

BEST FIT TECHNOLOGIES

Evans: Long-life hold-up and pulse energy for electric completion, setting, and firing functions

Paktron: Actuator-drive filtering and snubbing in temperature-compatible completion-control electronics

UTC: High-temperature decoupling and pulse support for gauges, controls, and initiator interfaces



8. Surface Interface & Downhole Communications



CAPACITOR FUNCTIONS

- Wireline cable power conditioning
- Telemetry modem filtering
- Transmitter/receiver matching
- DC blocking and signal coupling
- Surge/transient suppression
- Acquisition-system hold-up

BEST FIT TECHNOLOGIES

Evans: Hold-up support for surface acquisition and downhole communication electronics

Paktron: Low-ESR power filtering, DC-bus stabilization, and snubbing for surface interfaces

UTC: Interface decoupling, filtering, and transient support

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



THE EVANS GROUP ADVANTAGE



Compact energy storage for downhole electronics operating at temperatures up to 250°C



High Energy Density
High capacitance values in a compact form factor



Shock & Vibration
Rugged capacitor designs for drilling and wireline loads



Long-Life Reliability
Performance that minimizes downtime