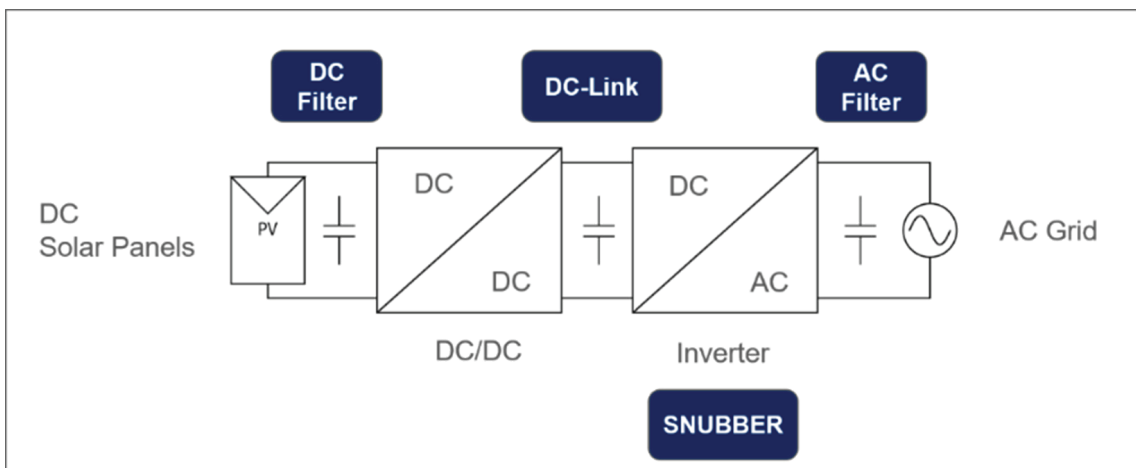




Capacitors for Photovoltaic Inverter Applications

Photovoltaic (PV) inverters are central to converting solar energy into usable AC power for homes, businesses, and the grid. By transforming DC output from solar panels, PV inverters ensure high efficiency, grid compatibility, and stable energy delivery even under fluctuating conditions. Modern inverter designs demand robust electronic components to guarantee reliability, safety, and performance across a wide range of environments. Capacitors are essential elements within PV inverters, performing functions such as voltage smoothing, filtering, surge protection, and power factor correction, which are crucial for optimized energy harvest and system longevity.



CAPACITOR FUNCTIONS IN PV INVERTERS

Capacitors play several key roles in PV inverter circuits, each addressing unique technical requirements:

DC LINK

DC Link Capacitors provide energy buffering, reduce voltage ripple, and manage high-frequency switching by stabilizing voltage between input and output stages. Capacitance Range: 100-1200 μF , with values determined by power rating and hold-up time requirements. Voltage Rating: 450-1500 VDC, with higher voltages eliminating the need for series connections. Film capacitors are increasingly preferred over aluminum electrolytics for DC link applications due to their superior ripple current handling, longer life, and ability to operate at higher voltages without series connections.

- BLH Series DC Link for Harsh Environments
- 947D High Energy Density DC Link Capacitors





AC FILTER

AC Filter Capacitors improve power quality by removing harmonics from inverter outputs and enabling reactive power compensation. Capacitance Range: 1-70 μF , with common values including 10-40 μF for smaller systems and up to 70 μF for larger installations. Voltage Rating: 250-1140 VAC, depending on system voltage requirements. AC filter capacitors typically use metallized polypropylene film construction with self-healing properties. The three-phase configurations can be either star or delta connected, with delta connections offering higher power density.

- ALH, AC Filter Capacitors for Harsh Environments
- PFCH, 3-Phase AC Power Harmonic Filter Capacitors



SNUBBER

Snubber Capacitors protect switching devices (e.g., IGBTs, MOSFETs) from voltage spikes and reduce electromagnetic interference. Capacitance Range: 0.01-12 μF , typically 0.1-1 μF for most inverter applications. Voltage Rating: 250-2000 VDC, should match or exceed switching device ratings. Polypropylene film capacitors with low inductance construction are preferred for snubber applications due to their excellent pulse handling capabilities.

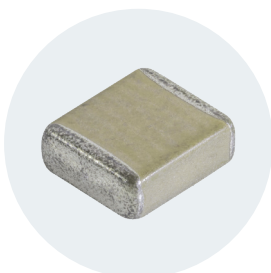
- PPR Series, Small Size Film Capacitors for High Pulse Current Applications.
- J-Lead C0G or X7R MLCCs



EMI SUPPRESSION / SAFETY

Safety Capacitors (Class X/Y) handle EMI suppression and support line-to-line or line-to-ground isolation for user safety.

- MYH, Y2, EMI, RFI Suppression Capacitors, Harsh Environment
- MXH, X2, EMI, RFI Suppression Capacitors, Harsh Environment
- Enhanced Safety Certified Class X1, X2, Y2 MLCC Capacitors



RESONANT

Resonant Capacitors ensure efficiency and frequency stability in advanced inverter topologies like LLC resonant converters.

- 1KV and 1.2KV C0G MLCC