

# Application Note

## Film caps for solar inverters

Growing demand for renewable energy is continuously driving the growth of solar inverter market size. For a power range up to 200kW, usually string converters are used. Learn how film capacitors with large current handling capability and safety functions contribute to the latest inverter design.



# Solar Inverters

**Panasonic**  
INDUSTRY

## PRODUCT

Metallized polypropylene film capacitors  
EZPV, ECWFD, ECWFE, ECWFG, ECQUB, ECQUA, EZPQ series

## PURPOSE

Metallized PP film capacitors featuring large current handling ability, high reliability and high safety, contribute to input & output filtering, EMI suppression, snubber and DC link circuits.

## FEATURES

High Safety: patterned metallization with fuse function  
High Humidity Resistance  
AEC-Q200 compliant products are also available  
RoHS Compliant



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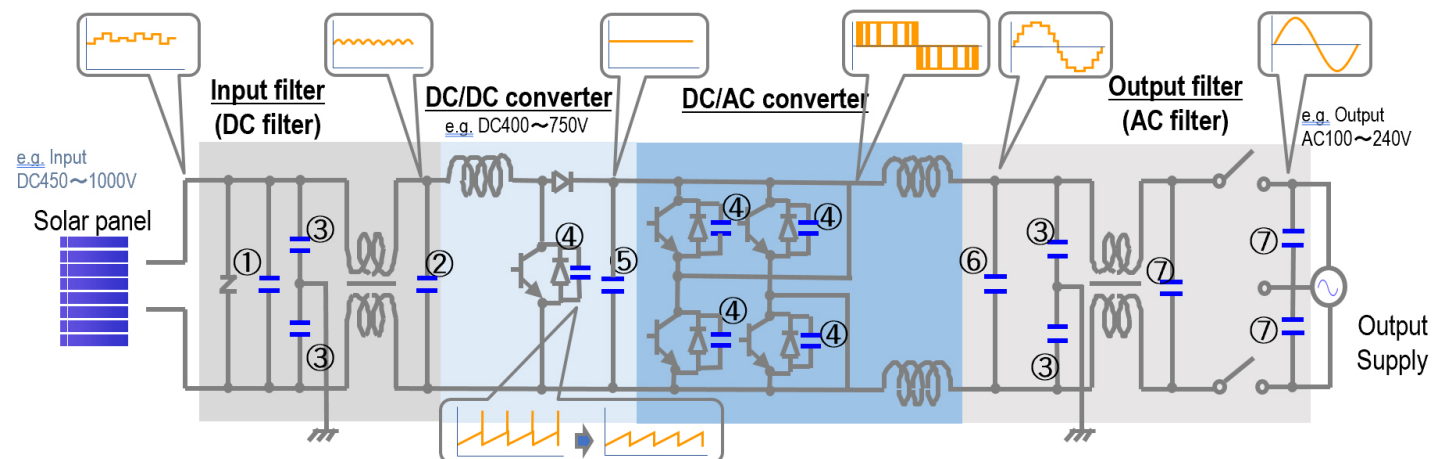
## FACTS & FUNCTION

Within string inverter market where standard film capacitors are more commonly used, inverters continue to evolve and improve aiming bigger and bigger max. input/output voltage. Ready to meet this need, Panasonic offers its various metallized PP film capacitors to optimize solar inverter circuit design, featuring large current handling ability, high reliability and high safety, contributing to input & output filtering, EMI suppression, snubber and DC link circuits.

At input side of primary DC filter circuit ① as well as at DC-link circuit ⑤, EZPV works for DC filtering with various voltage availability up to 1100VDC. It has a wide capacitance range

to achieve max. 110 $\mu$ F with one single component, and has both 2-pin and 4-pin terminal solution available.

At input side of DC/DC converter circuit, as well as in snubber circuit ② + ④ (in the circuit diagram), DC film capacitor series ECWFD (coating type), ECWFE and ECWFG (box type) are ideal solution for smoothing purpose. Different rated voltage values are available from 450VDC up to 1100VDC. Capacitance range expands from 0.01 $\mu$ F up to 12 $\mu$ F. High safety (thanks to built-in fuse function), high frequency characteristics and high ripple current capacity help these there series optimize the high voltage circuit of solar inverter.



Please find an overview of suitable products for each function ① - ⑦ on the next page.

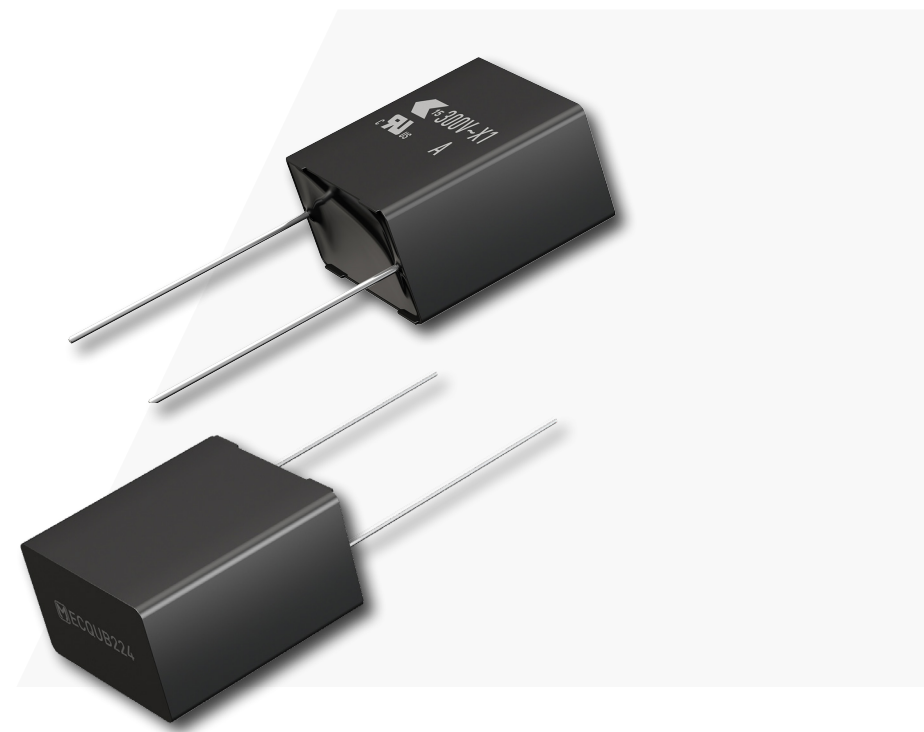
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## FACTS & FUNCTION

As the fundamental electric components used in output AC filters ⑥, EMI suppression capacitors ③+⑦ (class-X and class-Y) are required to handle high voltage impulses and protect users from harm due to electrical shock. Thanks to Panasonic's in-house patterned metallization technology (also well known as „built-in fuse function“), its ECQUA series (safety class X2) and ECQUB series (safety class X1 only) offer overvoltage impact reduction to realize high safety with open failure mode. Voltage values of 275VAC, 300VAC and 310VAC are available for different voltage level requirement. Furthermore, AC filtering ⑥ capacitors EZPQ series with higher rated voltage range (from 250VAC to 600VAC) are also available.

Considering that reliability especially humidity resistance is critical for solar inverter application due to outdoor usage, Panasonic has developed its proprietary enclosure sealing technology and aluminum vapor deposition to achieve high humidity resistance.

Application	① Input filter	② Input filter	③ Y2 cap.	④ Snubber	⑤ DC Link	⑥ Output filter	⑦ X2 cap.
Voltage	600VDC to 1100VDC	450VDC to 1100VDC	300VAC	450VDC to 1100VDC	600VDC to 1100VDC	250VAC to 600VAC	275VAC, 310VAC
Product	EZPV	ECWFD, ECWFE, ECWFG	ECQUB	ECWFD, ECWFE, ECWFG	EZPV	EZPQ	ECQUA



Application Note - How to solve various tasks with film capacitors for solar inverters

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Notes: Data and descriptions in this document are subject to change without notice.

Product renderings are for illustration purposes only and may differ from the real product appearance.