

Application Note

Film caps for compressor inverters

Highly efficient air conditioners use latest inverter technology to control the compressor in a smart way according to the real need. This saves energy, money and is beneficial for the environment. A crucial part of the power inverter are film capacitors used for smoothing.



Compressor inverters

Panasonic
INDUSTRY

PRODUCT

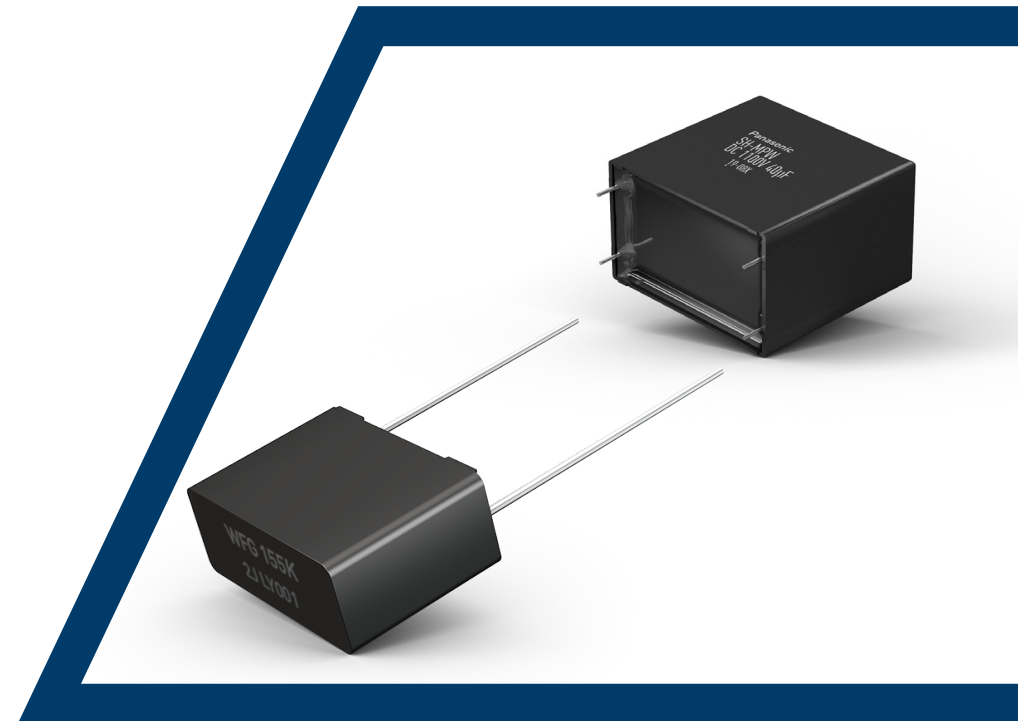
ECWFG and EZPV series metallized polypropylene film capacitor

PURPOSE

The inverter power board directly controls the air conditioner's compressor, which means the PCB is part of the outside unit. This means the needed smoothing capacitors must withstand high voltage, high temperature, fast and big temperature changes as well as high vibrations.

FEATURES

- High Safety: patterned metallization with fuse function
- High humidity resistance
- High thermal shock resistance (ECWFG series only)
- Wide voltage and capacitance range



Compressor inverters

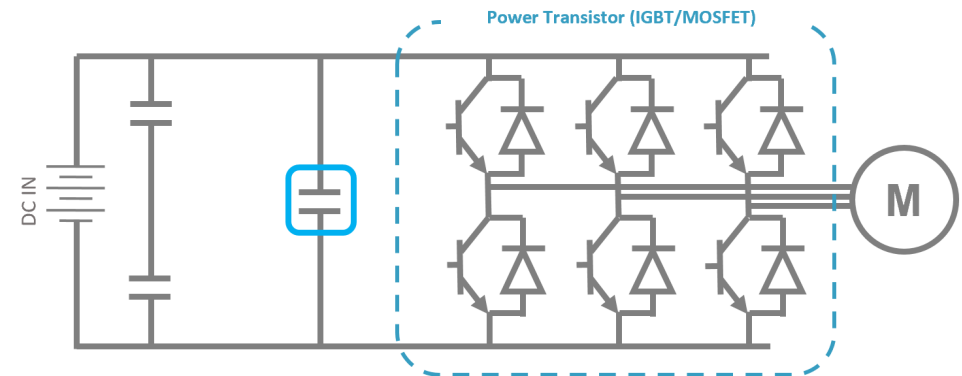
FACTS & FIGURES

The inverter for most electric A/C compressors have become located on the top of the compressor housing. However, inverter-integrated electric compressor has become more and more common nowadays.

In either way, the inverter device is a power system board on which high voltage system electrical components such as DC smoothing capacitors are required. Here, Panasonic Industry comes into play with its ECWFG and EZPV series of metallized PP film capacitors to optimize the smoothing function of the output DC wave form. They both offer high voltage capacity up to 1100VDC and together cover a wide capacitance range from 1 μ F to 110 μ F. High category temperature up to 110 $^{\circ}$ C (measured on capacitor case) meets the electric compressor's high temperature handling requirement.

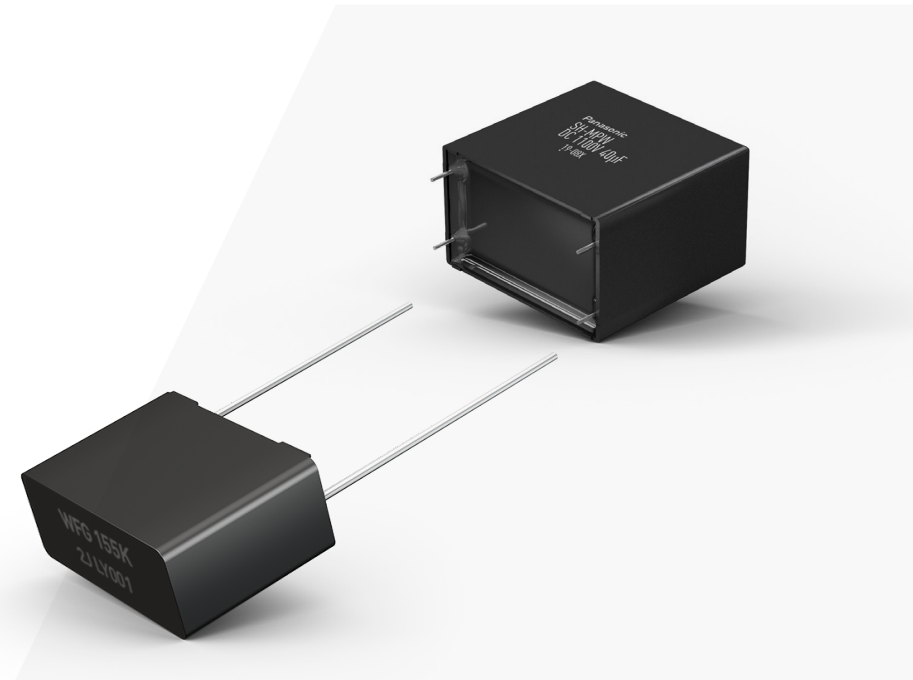
High humidity resistance (85 $^{\circ}$ C, 85%) thanks to Panasonic in-house enclosure sealing technology and aluminum vapor deposition ensure a super stable capacitance level and therefore guarantees high reliability and long product durability.

High safety (thanks to built-in fuse function), and high ripple current capacity help these two series optimizing the high power output performance of the circuit. Furthermore, ECWFG series feature high thermal shock resistance (600VDC to 1100VDC: -55 $^{\circ}$ C to 85 $^{\circ}$ C for 1000 cycles), which provides excellent withstand performance against rapid change of temperature in the circuit.



A simple diagram of inverter for electric compressor

Function	Smoothing	
	Product series	ECWFG
Voltage	600VDC to 1,100VDC	
Capacitance	1 μ F to 12 μ F	3 μ F to 110 μ F
Temperature range	-40 $^{\circ}$ C to 110 $^{\circ}$ C	-40 $^{\circ}$ C to 105 $^{\circ}$ C
Fuse function	built-in	
Thermal shock resistance	yes	-



Application Note - How to solve various tasks with film capacitors for on-board chargers

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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.