POWER PLAY SOLUTIONS™

Protection for Consumer Offline Power Supplies

Up to IEC 61000-4-5 Level 2 Solution

Solution Products

ACTP250J1BJR-S

FW30A10R0JA

MOV-10DxxxK

Situation

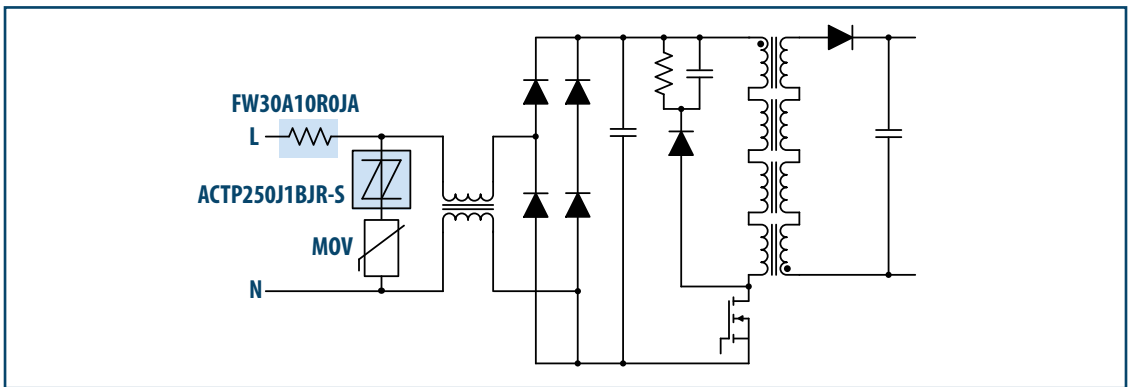
Metal Oxide Varistors (MOVs) are traditional solutions for offline power converters offering protection from differential surges (2 ohm impedance) of greater than 2 kV. MOVs work by clamping the incoming transient and reducing the peak current, which typically stresses the diodes and bulk capacitor. To effectively protect consumer-grade offline power supplies, it is necessary for the solution to be small and compact and it must be able to handle the surge requirement for IEC 61000-4-5 Level 2 of 1 kA.

This Bourns® Power Play Solution™ outlines a design approach that uses the Bourns® ACTP transient protector in series with a MOV, thereby keeping the leakage of the MOV to a minimum without affecting its clamping voltage capability. For surge currents higher than 1 kA, a GDT in series with the MOV solution should be used instead, or Bourns® GMOV™ or IsoMOV™ series protectors.

Bourns® Power Play Solution™

Offering a cost-effective, compact overvoltage protection solution with a rating of 1 kA, Bourns® Model ACTP250J1BJ AC Transient Protector is a bidirectional thyristor designed to be used in series with an MOV. It is designed to help protect a power supply from damage due to an overvoltage condition on its AC input lines. The Bourns® transient protector raises the turn-on voltage threshold of the series combination against low frequency overvoltage conditions, and has a minimal impact on the voltage clamp level when subjected to a lightning surge. Using this series combination will prevent the MOV from conducting when line frequency voltage swells occur, allowing designers to avoid the use of a higher voltage MOV. It is also recommended to use a Bourns® fuse resistor that features a 10 ohm resistance range and 3 watt power. Bourns® Model FW30A10R0JA fuse resistor is capable of limiting the inrush current to an acceptable level and can also act as a disconnect should a short circuit occur.

The circuit shown below illustrates Bourns' optimized overvoltage protection solution utilizing its AC transient protector and fusible resistor.



Qty.	Component Description	Part Number & Data Sheet Link	Distributor Inventory
1	AC Transient Protector	ACTP250J1BJR-S	Check Stock
1	Fusible Resistor	FW30A10R0JA	Check Stock
1	Metal Oxide Varistor (MOV)	MOV-10DxxxK	Check Stock

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Summary

Industry: Consumer

Application: Consumer-grade Offline Power Supply

Product: AC Transient Protector:

Bourns® Model ACTP250J1BJ

Fusible Resistor:

Bourns® Model FW30A10R0JA

Metal Oxide Varistor (MOV):

Bourns® Series MOV-10DxxxK

Benefits: Increases power supply reliability by reducing stress on the diodes and bulk capacitor

Compliance

Both components are UL recognized. This Bourns® Power Play Solution™ also helps designers meet IEC 61000-4-5 Level 2 regulatory compliance.

Benefits

The benefits of employing this Bourns® Power Play Solution™ for a consumer-grade offline power supply are that it significantly reduces stress on the diodes and capacitor increasing application reliability. In addition, there is no degradation of MOV leakage current over time, and it does not compromise the clamping voltage capability of the MOV.

Additional Resources

For more PowerPlay Solutions from Bourns, visit the link below:

- Bourns® Power Play Solutions™

www.bourns.com

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