POWER PLAY SOLUTIONS™

Protection for Exposed 120 VAC Power Ports in 5G Infrastructure

Up to IEC 61000-4-5 Level 3 Solution

Solution Products

PTVS1-190C-TH

GDT25-60-S1-RP

Situation

While most 120 VAC power ports in today's more sensitive equipment designs require some sort of circuit protection, new 5G wireless infrastructure, in particular, demands best-in-class surge protection to meet low latency reliability specifications and to ensure maximum system uptime expectations are met. Further, the high-volume nature of 5G infrastructure deployment budgets also necessitate keeping these power port protection costs low.

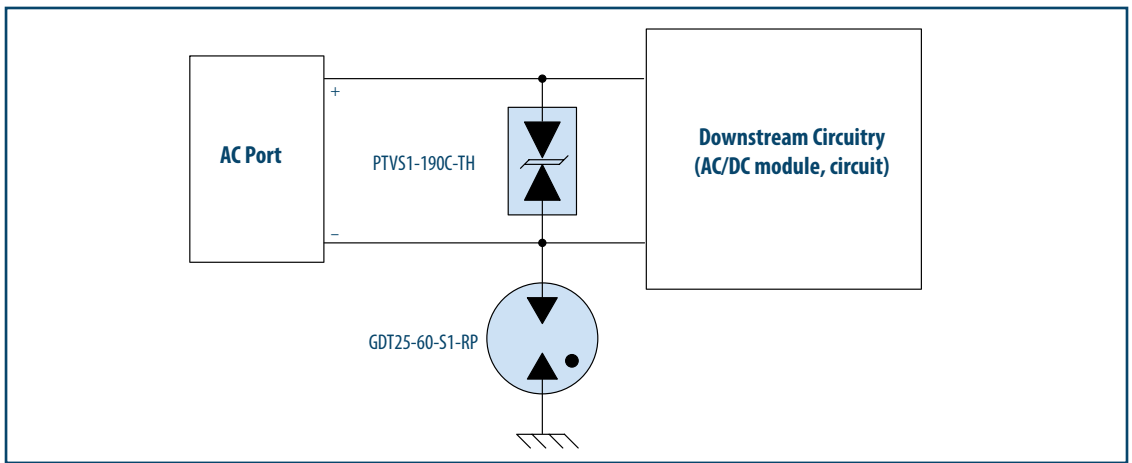
This Bourns® Power Play Solution™ presents a cost-effective Power TVS Diode protection solution for exposed 120 VAC power ports. It demonstrates the fast surge protection and low clamping voltage advantages of the recommended solution and presents how it meets the low clamping voltage (227 V @ 1 kA, 8/20 µs) requirement for IEC 61000-4-5 Level 3 regulatory compliance. Enhanced performance alternatives are also listed for applications that require a higher rating.

Bourns® Power Play Solution™

There are many choices for port protection and designers often have to weigh which solution is best for their system based upon factors such as price versus performance and/or space limitations versus ideal component capabilities. Most protection solutions feature clamping voltages that are too high and surge protection performance that is too slow for what is required for 5G infrastructure.

As a semiconductor device, this Power TVS (PTVS) Diode solution from Bourns delivers faster surge protection performance at a lower clamping voltage compared to other existing solutions. These capabilities also help extend operational life and thereby enhance reliability. With the ability to react faster to transient threats, Bourns® Model PTVS1-190C-TH is able to withstand a 1 kA surge under 8/20 µs conditions with a maximum working voltage of 190 V.

The circuit shown below illustrates Bourns' optimized AC power protection solution utilizing its Model PTVS1 and GDT25 series products.



Qty.	Component Description	Part Number & Data Sheet Link	Distributor Inventory
1	Next-Generation Fast Acting GDT	GDT25-60-S1-RP	Check Stock
1	Power TVS Diode	PTVS1-190C-TH	Check Stock

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Summary

Industry: 5G Wireless Infrastructure

Application: 120 VAC Power Port Surge Protection

Product: Power TVS Diode:
Bourns® Model PTVS1-190C-TH
and Gas Discharge Tube:
Bourns® Model GDT25-60-S1-RP

Benefits: Very fast surge protection coupled with fast-acting protection isolation

Compliance

Both components are UL recognized. This Bourns® PowerPlay Solution™ also helps designers meet IEC 61000-4-5 Level 3 regulatory compliance. For Level 4 compliance and beyond, the higher current components listed under "Alternate Recommendations" can be used as alternatives.

Benefits

The Bourns® Power Play Solution™ for 120 VAC power ports combines the superior clamping voltage of the PTVS Diode and the tighter voltage limiting features of its GDT25 device which help minimize stress in the downstream AC/DC circuit.

This cost-effective solution can be applied with similar results to the many exposed power ports in the wide range of currently deployed 120 VAC-based applications.

Alternate Recommendations

For applications that require protection for higher voltages or higher surge current, the Bourns® PTVS diode models below offer enhanced features:

3 kA Protection
- PTVS3-430C-TH

6 kA Protection
- PTVS6-380C-TH
- PTVS6-430C-TH

10 kA Protection
- PTVS10-380C-TH
- PTVS10-430C-TH
- PTVS10-470C-TH

Additional Resources

The following related resources are also available from Bourns:

- Bourns® Power Play Solution™: Universal AC Power (UACP) Protection
- Application Note: Why PTVS Diodes are Optimal Solutions for User System and Power Supply Circuit Protection
- Application Note: Surface Mount Power TVS Diodes Deliver Optimal Protection for Power Supplies
- White Paper: Advancing GDT Technology to Meet Higher Surge and Multi-level Protection Requirements
- Design Note: Histogram Comparison Between Next-Generation Bourns® Model GDT25 Series and Legacy Bourns® Model 2035 Series Gas Discharge Tubes (GDTs)
- Application Note: Procedure for Obtaining Accurate GDT Capacitance Values for High Frequency Circuits

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