



Protection & Power Conversion Solutions for Uninterruptible Power Supplies



BOURNS®

Introduction

Uninterruptible Power Supply (UPS) systems are vital for ensuring continuous power in mission-critical environments like data centers, hospitals, and security infrastructure. These systems protect against power disturbances—such as surges, swells, and outages—by maintaining a stable output even when the electrical grid fails. At the heart of a UPS are multiple stages of power conversion and protection functions that need to be supported by specialized components.

Bourns offers a broad portfolio of circuit protection and power semiconductor products that enhance UPS reliability. Key solutions encompass Bourns® IsoMOV® hybrid protectors that innovatively combine Metal Oxide Varistor (MOV) and Gas Discharge Tube (GDT) technologies to safeguard against overvoltage events. Bourns' wide portfolio of fuses act as a final defense against severe overcurrent conditions, preserving system integrity. For efficient power conversion, Bourns offers Silicon Carbide (SiC) Diodes and Insulated Gate Bipolar Transistors (IGBTs) that are designed to deliver high-speed switching and thermal stability.

For battery management and control, Bourns® Multifuse® Polymer PTC Resettable Fuses, TVS diodes, and TBU® High-Speed Protectors (HSPs) help maintain necessary uptime and reduce maintenance costs. These components work together to ensure UPS systems operate safely, efficiently, and without interruption, giving designers a trusted partner in effective power protection.

This brochure highlights Bourns' wide selection of protection and power conversion products and provides specific model recommendations that match UPS design specifications.

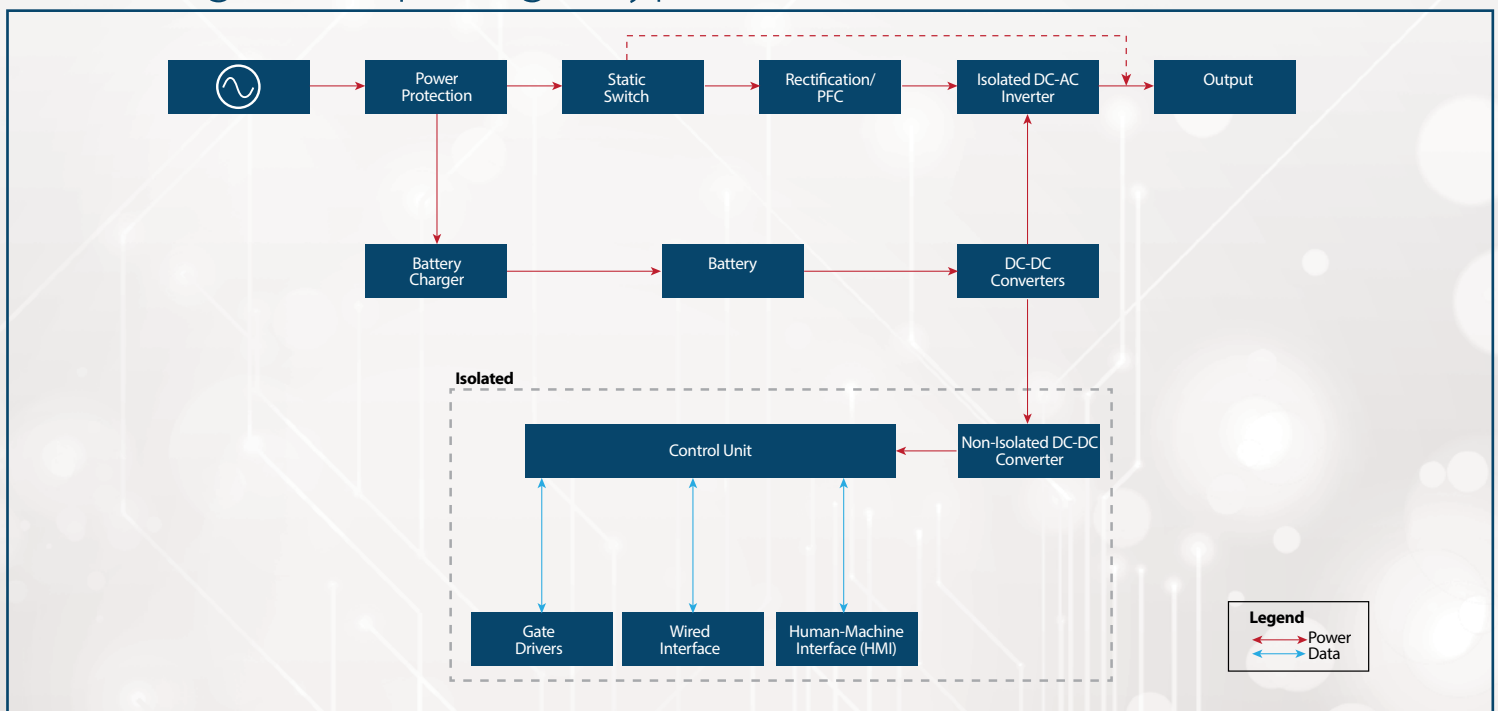




Bourns® Product Offerings

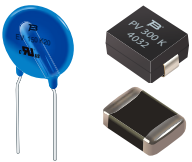
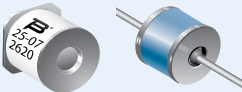



- Gas Discharge Tubes (GDTs)
- Insulated Gate Bipolar Transistors (IGBTs)
- Silicon Carbide (SiC) Schottky Diodes
- Power TVS Diodes
- TVS Diodes and Arrays
- Rectifier Diodes
- ChipGuard® ESD Suppressors
- Thick Film and Wirewound Resistors
- Current Sense Resistors
- Multifuse® Polymer PTC Resettable Fuses
- SinglFuse™ SMD Fuses
- PowerTherm™ Negative Temperature Coefficient (NTC) Thermistors
- IsoMOV® Hybrid Protectors
- Trimpot® Trimming Potentiometers
- TBU® High-Speed Protectors (HSPs)
- Multilayer Varistors (MLVs)
- Varistors

Block Diagram Depicting A Typical Double Conversion Online UPS



Bourns® Product Recommendations

Power Protection


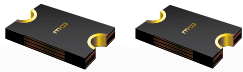
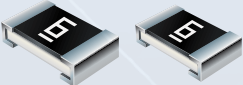
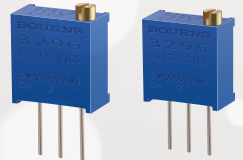
Product Image	Recommended Products	Description	Specifications and Features
	<p>Varistors</p> <p>Through-hole: EV, CV, CVQ, MOV-20D, SV Series</p> <p>SMD: PV Series</p>	<p>Varistors are conventional overvoltage protection components that offer an industry-standard form. These components “clamp” excess voltage conditions.</p>	<ul style="list-style-type: none"> • Max. Voltage: 14-1465 VDC • Max. Peak Current: 100-15000 A, 8/20 μs • Operating Temperature: -55 to +125 °C • Up to 23 mm disc sizes • Through-hole and SMD packages available • UL 1449 Listed
	<p>Gas Discharge Tubes (GDTs)</p> <p>GDT25 Series 2035-xx-XX Series</p>	<p>Gas Discharge Tubes (GDTs) are a conventional overvoltage protection component with high surge current capacities. These components “crowbar” when excess voltage is present.</p>	<ul style="list-style-type: none"> • Breakdown Voltage: 75-800 V • Up to 25 kA peak current, 8/20 μs waveform • Operating Temperature: -55 to +125 °C • Through-hole and SMD packages available
	<p>Hybrid Protectors</p> <p>GMOV™ Series IsoMOV® Series</p>	<p>Combination of MOV and GDT technology in one package. These components have extremely low leakage current and extended reliability.</p>	<ul style="list-style-type: none"> • Max. Voltage: 56-745 VDC • Max. Peak Current: 6-15 kA, 8/20 μs • Operating Temperature: -40 to +125 °C • Disc Size: 10-20 mm • Through-hole components
	<p>PowerTherm™ Negative Temperature Coefficient (NTC) Thermistors</p> <p>BN-LG15Y Series</p>	<p>PowerTherm™ Negative Temperature Coefficient (NTC) Thermistors are used as inrush current limiters (ICLs) for systems with DC-bus capacitors or inductive loads such as motor drivers that can draw high current levels on startup. ICLs prevent this event from occurring.</p>	<ul style="list-style-type: none"> • Resistance Range: 0.7-220 Ω • Max. Current: 0.3-15 A • Max. Power: 1.6-7 W • Through-hole components with disc diameters up to 25 mm • Operating Temperature: -40 to +200 °C
	<p>PowrFuse™ High-Power Fuses</p> <p>PF63R50H Series</p>	<p>POWRFuse™ High-Power Fuses are rated at extremely high interrupting currents, providing reliable overcurrent and short-circuit protection.</p>	<ul style="list-style-type: none"> • Rated Voltage up to 1000 VDC/800 VAC • Rated Current: 6-400 A • Interrupt Rating up to 160 kA • Designed to UL 248 & IEC 60269 standards • Multiple mounting types available • Automotive grade fuses offered (ISO 8820-8)

High Power Conversion and Battery

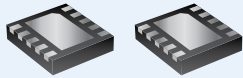

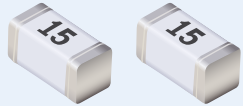
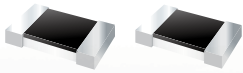
Product Image	Recommended Products	Description	Specifications and Features
	Silicon Carbide (SiC) Schottky Barrier Diodes BSDD05G120E2 Series	High efficiency diodes that allow the best performance for high voltage and high power applications with practically no switching losses. Best used for PFC and other switch-mode topologies. Also used in high-efficiency snubber and free-wheeling designs.	<ul style="list-style-type: none"> • Max. Reverse Voltage: 650-1200 V • Max. Forward Current: 5-10 A • Junction Temperature: -55 to +175 °C • Through-hole and surface mount packages available • Low Q_{rr}
	Insulated Gate Bipolar Transistors (IGBTs) BIDD05N60T Series	These devices use advanced Trench-Gate Field-Stop technology providing greater control of the dynamic characteristics while resulting in fewer switching losses. Great for use in active rectifier, PFC, or motor drive circuits. High and medium speed grades are available.	<ul style="list-style-type: none"> • Max. V_{CE}: 600-650 V • Max Current: 12-75 A • Junction Temperature: -55 to +175 °C • Through-hole and surface mount packages available • Trench-Gate Field-Stop technology
	Power TVS Diodes PTVS1-240C-M Series	Power TVS Diodes provide outstanding protection for Direct Current (DC) bus applications. TVS Diodes provide tighter clamping with superior speed over traditional varistor technology.	<ul style="list-style-type: none"> • Standoff Voltage: 15-470 V • Max. Peak Current: 1-20 kA, 8/20 μs • Surface mount • Bidirectional
	Thick Film Resistors PFS35 Series	Bourns offers a broad range of resistors for use in precision monitoring, braking, surge protection, and snubbing circuits.	<ul style="list-style-type: none"> • Resistance Range: 0.01 Ω–130 kΩ • Power Rating: 20-300 W • Tolerance: 1–5 % • Standard packages available
	Wirewound Resistors PWR6927 Series	Bourns offers a broad range of resistors for use in precision monitoring, braking, surge protection, and snubbing circuits.	<ul style="list-style-type: none"> • Resistance Range: 0.005 Ω–320 kΩ • Power Rating: 0.1-500 W • Tolerance: 0.01–10 % • Standard packages available • Low inductance
	Current Sense Resistors CSI2H-2512 Series	Bare metal SMD shunts for precision monitoring of current. All blocks will incorporate some form of current monitoring for accurate switching characteristics.	<ul style="list-style-type: none"> • Resistance Range: 0.2-5 mΩ • Power Rating: 1.5-15 W • Tolerance: 1 %, 2 %, 5 % • Temperature Coefficient: 50 PPM/°C • Surface mount • Low thermal EMF
	Rectifier Diodes CD-DF4xxSL Series	DC-DC converters incorporate diodes to rectify output power. Diodes are crucial to the operation of converters. Bourns offers both Schottky and PN variants to suit a wide range of applications.	<ul style="list-style-type: none"> • Peak Reverse Voltage: 20-1600 V • Forward Current: 0.2-4 A • Peak Surge Current: 2-150 A • Single/Bridge configurations • Schottky and PN technologies

Bourns® Product Recommendations

Auxiliary Power

Product Image	Recommended Products	Description	Specifications and Features
	TVS Diodes SMF4C Series	For precision overvoltage protection of low voltage DC busses. Can protect against residual surge energy and Electrostatic Discharge (ESD). Quick clamping action with several power options and voltages available.	<ul style="list-style-type: none"> Working Peak Reverse Voltage: 2-495 V Power Rating: 400-15000 W Industry standard SMD packages Tight clamping action
	Multilayer Varistors (MLVs) BVRA1812 Series	For overvoltage protection in lower voltage ranges.	<ul style="list-style-type: none"> Working Voltage: 14-385 VDC Peak Surge Current: 30-1200 A Standard SMD packages available Plastic encapsulated PV varistors as direct cross to through-hole MOVs
	Current Sense Chip Resistors CRM Series	Precision SMD current sense resistors ideally suited for Pulse Width Modulation (PWM) circuits. SMD shunts provide tight tolerances with low temperature drift in a small footprint.	<ul style="list-style-type: none"> Resistance Range: 1 mΩ - 1 MΩ Power Rating: 0.1-3 W Tolerance: 0.5-5 % Metal and film technologies Low thermal EMF
	Multifuse® Polymer PTC Resettable Fuses MF-MSMF Series	Resettable overcurrent protection. Good for low to mid voltage and low to mid current DC busses and inputs. SMD packages available.	<ul style="list-style-type: none"> Maximum Voltage: 6-60 VDC Hold Current: 0.1 - 3.0 A Operating Temperature: -40 to 85 °C SMD Fast Time-to-Trip (TTT) Excellent solderability with ENIG terminal Symmetrical designs and low profile
	SinglFuse™ SMD Fuses SF-0603SP-R Series	SinglFuse™ SMD Fuses act as overcurrent protection devices for critical components. Faster than PTCs, but not resettable. SMD packages and various technologies available.	<ul style="list-style-type: none"> Rated Voltage: 24-250 VDC; AC rated available Rated Current: 62 mA to 50 A Film and metal technologies Various fusing characteristics
	Trimpot® Trimming Potentiometers 3296 Series	Bourns® Trimpot® Trimming Potentiometers perform a variety of precision circuit adjustments, allowing the converter to be precisely adjusted as needed. Offered in single or multiturn models, SMD or through-hole.	<ul style="list-style-type: none"> Power Rating: 0.1-1 W Resistance Range: 10 Ω to 2 MΩ Number of Turns: 1-25 Surface mount and through-hole packages offered Precise adjustability

Interface Protection

Product Image	Recommended Products	Description	Specifications and Features
	TVS Diode Arrays CDDFN10-3304NA Series	Ultra-low capacitance overvoltage protection of several data lines. Bourns offers an extensive line of diode arrays for all types of communication protocols.	<ul style="list-style-type: none"> Working Peak Reverse Voltage: 2.2-70 V Typical Capacitance: 0.02-500 pF Protection for up to eight lines in a single package Surface mount with DFN packages
	TBU® High-Speed Protectors (HSPs) TBU-DF Series	TBU® HSPs are resettable, ultra-fast overcurrent protection devices. Offered in dual and single DFN packages, the TBU® HSP guards against power cross, lightning, and other energy surges on communication lines, up to rated limits.	<ul style="list-style-type: none"> Max. Impulse Voltage: 40-850 V Max. RMS Voltage: 28-425 V Trigger Current: 50-500 mA Protects up to two data lines in a single package Uni- and bidirectional options
	Gas Discharge Tubes (GDTs) GDT21 Series	GDTs are conventional overvoltage protection components with high surge current capacities. These components “crowbar” when excess voltage is present. They offer extremely low capacitance making them suitable for low insertion loss devices for communication lines.	<ul style="list-style-type: none"> Breakdown Voltage: 90-500 VDC Temperature Range: -55 to +105 °C Low capacitance <2.9 pF Compact, surface mount package
	ChipGuard® ESD Protectors CG0201MLU Series	Varistor-based ESD protection in a small, SMD form factor boasting low capacitance.	<ul style="list-style-type: none"> Working voltage: 3.3-56 V Low capacitance Response time: <0.5 ns Standards: IEC 61000-4-2 & 61000-4-3 ESD protection in a small footprint

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Specifications subject to change without notice. Actual performance in specific customer applications may differ due to the influence of other variables. Customers should verify actual device performance in their specific applications.

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