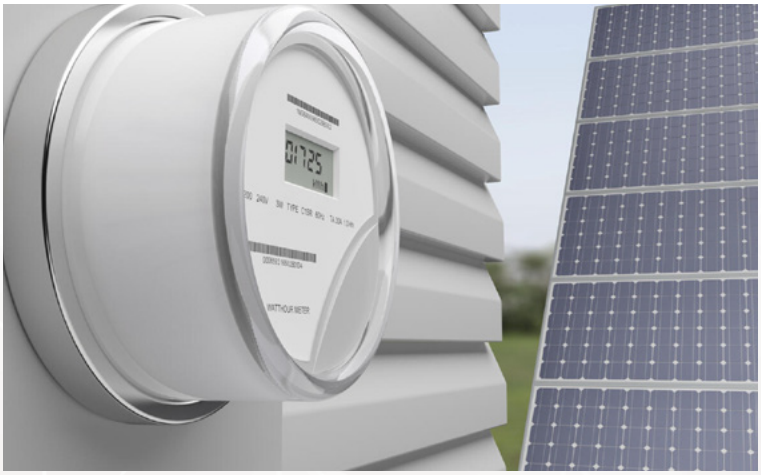
Protection & Power Conversion Solutions for Smart Meters

BOURNS®

Introduction

Smart meters are essential to modern energy infrastructure, enabling accurate measurement, real-time monitoring, and reliable communication between utilities and end-users. Deployed across residential, commercial, and industrial environments, smart meters support reliable billing, load management, and grid optimization. These systems must operate continuously in harsh electrical environments, withstanding power disturbances such as lightning surges, electrostatic discharge, and switching transients, while maintaining precise measurement and secure data transmission. These are devices that are required to operate with reliability and precision. The balance between high performance and durability in a smart meter is a major design consideration.

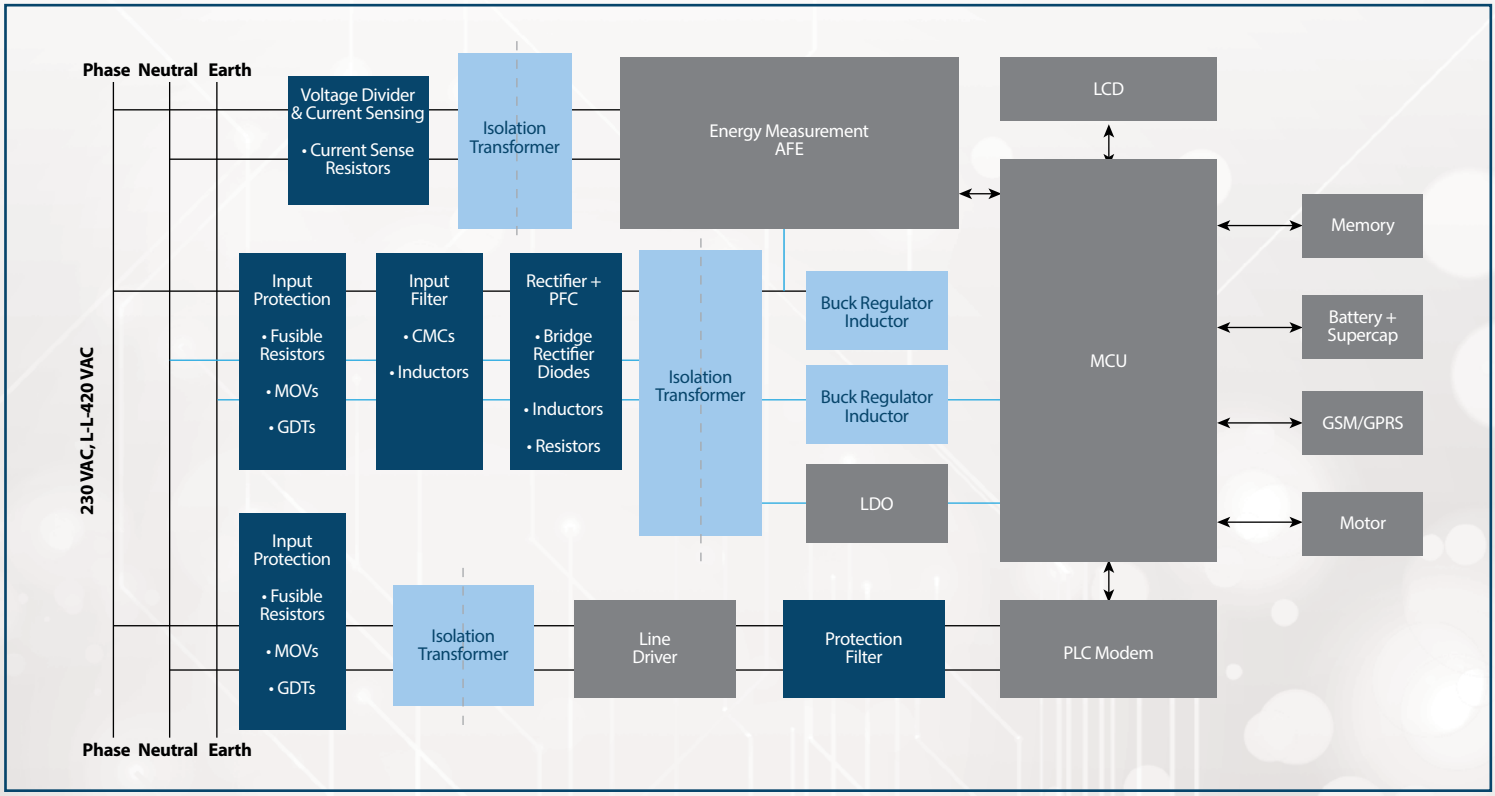
Bourns is a leading manufacturer of circuit protection devices, which are designed to protect the sensitive internals of the smart meter. Their vast catalog of products includes many that are suited for the high demands of smart meters, such as high-power shunt resistors, resettable fuses, power fuses, Metal-Oxide Varistors (MOVs), Gas-Discharge Tubes (GDTs), IsoMOV® Hybrid Protectors, bridge rectifier diodes, and many more. This brochure highlights Bourns® broad selection of protection, sensing, and power management products and provides targeted model recommendations tailored to smart meter design requirements.



Bourns® Product Offerings

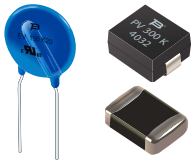
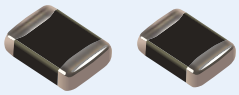
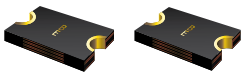
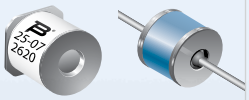
- Varistors
- Gas Discharge Tubes (GDTs)
- GMOV™ Hybrid Protectors
- IsoMOV® Hybrid Protectors
- PowrFUSE™ High-Power Fuses
- Power TVS Diodes
- Silicon Carbide (SiC) Schottky Diodes
- TVS Diodes and Arrays
- Thick Film and Wirewound Resistors
- ChipGuard® ESD Suppressors
- Current Sense Resistors
- Multifuse® Polymer PTC Resettable Fuses
- Trimpot® Trimming Potentiometers
- TBU® High-Speed Protectors (HSPs)
- Multilayer Varistors (MLVs)

Block Diagram

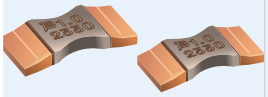
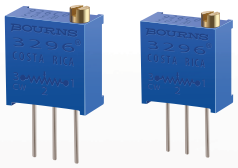


Bourns® Product Recommendations

Circuit Protection Products

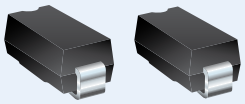
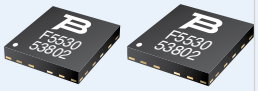
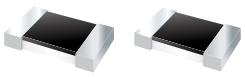
Product Image	Recommended Products	Description	Specifications and Features
	Varistors Through-hole: EV, CV, CVQ, MOV-20D, SV Series SMD: PV Series	Varistors are conventional overvoltage protection components that offer an industry-standard form. These components "clamp" excess voltage conditions.	• Max. 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
	Multilayer Varistors (MLVs) BVRA1812 Series	For overvoltage protection in lower voltage ranges.	• 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
	Multifuse® Polymer PTC Resettable Fuses MF-MSMF Series	Resettable overcurrent protection. Good for low-voltage and low-current DC busses and inputs. SMD packages available.	• Maximum voltage: 6-72 VDC • Hold current: 0.05-13 A • Operating temperature: -40 to 125 °C • SMD and through-hole packages • Fast Time-to-Trip (TTT)
	Gas Discharge Tubes (GDTs) GDT25 Series 2035-xx-XX Series	Gas Discharge Tubes (GDTs) are a conventional overvoltage protection component with high surge current capacities. These components "crowbar" when excess voltage is present.	• 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
	Hybrid Protectors GMOV™ Hybrid Protectors IsoMOV® Hybrid Protectors	Combination of MOV and GDT technology in one package. These components have extremely low leakage current and extended reliability.	• 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
	PowrFuse™ High-Power Fuses PF63R50H Series	POWrFuse™ High-Power Fuses are rated at extremely high interrupting currents, providing reliable overcurrent and short-circuit protection.	• 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)

Resistive Products

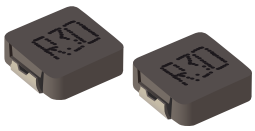
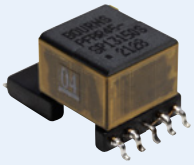
Product Image	Recommended Products	Description	Specifications and Features
	Current Sense Resistors CSI2H-2512 Series	Bare metal SMD shunts for precision monitoring of current. All blocks will incorporate some form of current monitoring for accurate switching characteristics.	• Resistance range: 0.2-5 mΩ • Power rating: 1.5-15 W • Tolerance: 1 %, 2 %, 5 % • Temperature coefficient: 50 PPM/°C • Surface mount • Low thermal EMF
	Thick Film Resistors PF2472 Series	Bourns offers a broad range of resistors for use in precision monitoring, braking, surge protection, and snubbing circuits.	• 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.	• Resistance range: 0.005 Ω-320 kΩ • Power rating: 0.1-500 W • Tolerance: 0.01-10 % • Standard packages available • Low inductance
	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.	• 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

Bourns® Product Recommendations

Semiconductor Products

Product Image	Recommended Products	Description	Specifications and Features
	TVS Diodes SMF4C Series	For precision overvoltage protection of low voltage DC buses. Can protect against residual surge energy and Electrostatic Discharge (ESD). Quick clamping action with several power options and voltages available.	• Working peak reverse voltage: 2-495 V • Power rating: 400-15000 W • Industry standard SMD packages • Tight clamping action
	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.	• Standoff voltage: 15-470 V • Max. peak current: 1-20 kA, 8/20 µs • Surface mount • Bidirectional
	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.	• 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
	ChipGuard® ESD Protectors CG0201MLU Series	Varistor-based ESD protection in a small, SMD form factor boasting low capacitance.	• 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

Magnetics Products

Product Image	Recommended Products	Description	Specifications and Features
	Isolation Transformers Basic & Reinforced Isolation	Reliable signal isolation components optimized for accuracy, durability, and low noise across high-speed communication and networking interfaces.	• Fully automated with overmolding process • High isolation reliability in a compact size • Working voltage up to 1000 VDC • Hi-Pot: 5000 VDC, 1 mA, 60 sec. • RoHS compliant*
	Inductors	Compact, high-current inductors delivering stable performance, low EMI, and superior thermal handling in high-frequency power conversion systems.	• High saturation current • Inductance range: 1.0 to 68 µH • Heating current up to 2.7 A • RoHS compliant*
	Isolation Transformers PFB Series	Reliable signal isolation components optimized for accuracy, durability, and low noise across high-speed communication and networking interfaces.	• Surface mount • Frequency up to 1 MHz • Operating temperature -40 °C to 125 °C • RoHS compliant*
	EMC Chokes Common Mode Chokes	Comprehensive EMI filters and RF components ensuring compliance, noise suppression, and stable performance in complex electronic systems.	• Compact size • Tape and reel packaging • RoHS compliant*

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

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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.