

BOURNS®

PRODUCT PROFILE



Automotive
Circuit Protection Solutions
Connectors & Switches
Customized Packaging
Magnetics

Precision Variable Resistors
Resistive Products
Sensors & Controls
Surge Protective &
Outside Plant Products

Bourns® Product Profile

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Solutions in Sensor Technology

Types Available:

- Customer specific
- Position, speed and torque sensors

Features:

- Contacting and non-contacting solutions
- Engineering support capabilities
- All Bourns manufacturing sites are TS 16949 certified and ISO 26262 compliant
- In-house design, toolmaking, screenprinting, cermet firing & injection molding capabilities
- Development of proprietary resistive ink
- Innovative & cost-effective solutions



Applications

- ABS wheel speed
- Accelerator pedal
- Active steering
- Brake pedal module
- Chassis level
- Electric park brake
- EPAS
- Exhaust gas recirculation
- Fuel tank level
- Steer-by-wire
- Steering torque
- Throttle position
- Transmission position
- Transmission speed

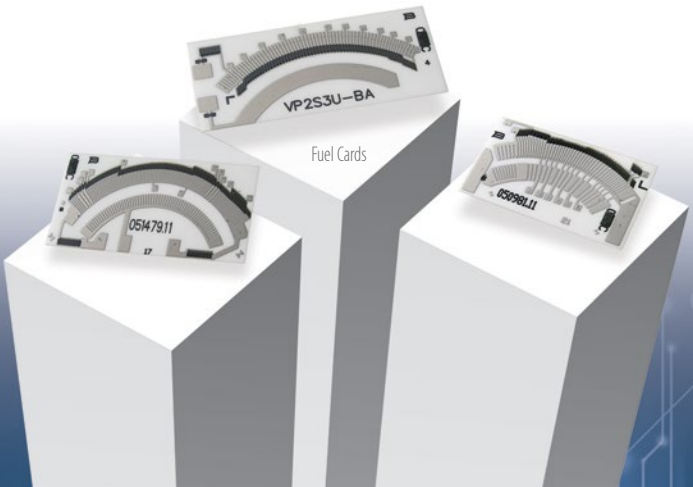
Fuel Cards

Types Available:

- Rectangular ceramic substrates
- Various ink systems:
 - Resistor
 - Terminations/wiper tracks
 - Protective glazes/polymers
- Wires attached
- Tinned solder pads
- Single or double side printing

Features:

- Customer specific patterns
- Up to 100 discrete resistance steps
- Typical resistance ranges from 95 ohms to 1.7k ohms
- Rated current 100 mA
- In line, 100 % dynamic electrical test
- Life cycles:
 - Up to 1 million dry
 - Up to 3 million wet



Applications

Fuel level sensing in fuel delivery systems:

- Scooters/motorcycles
- Light duty trucks
- Off-road equipment
- Passenger cars
- SUVs

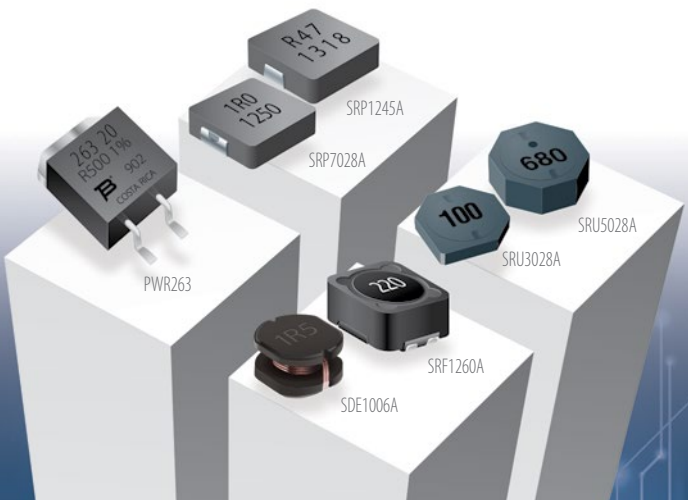
Automotive Circuit Conditioning

Types Available:

- Inductors
- Transformers
- Power resistors
- Metal alloy shunts

Features:

- AEC-Q200 qualified
- TS 16949 factory produced
- Automotive temperature capable
- High quality and reputation



Applications

- Start-stop
- Networking
- Electronic control Modules/ECU
- Infotainment, telematics, navigation, connected car
- DC/DC & AC/DC power supplies
- Lighting
- Body control
- Diagnostic tools
- Battery management
- Instrument cluster

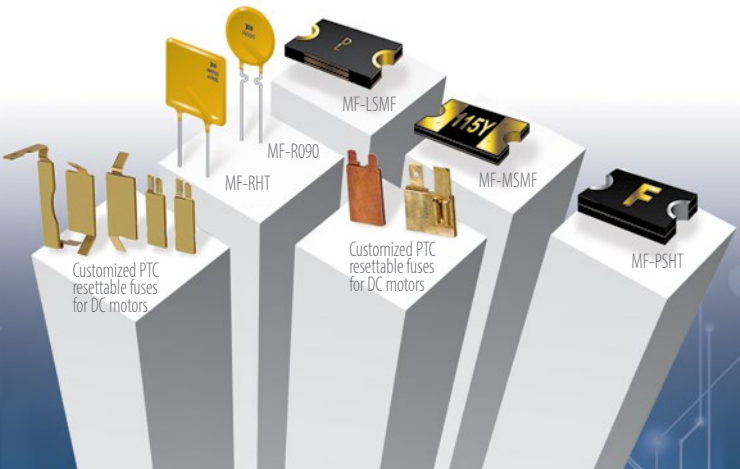
Automotive Circuit Protection

Types Available:

- Multifuse® PPTC resettable fuses
- ChipGuard® MLVs

Features:

- Overcurrent protection for automotive applications
- TS 16949 quality system
- Resettable PTCs suitable for application temperatures up to 125 °C
- Majority certified to AEC-Q200-Rev C
- Wide range of current ratings (0.05 - 20 A)
- Dedicated automotive CP team



Applications

- Window regulators
- Seat adjustment motors
- Sunroof activation motors
- Powerbus (mode protection) applications
- Other DC motor applications
- Car alarm systems
- Power steering motors
- GPS shark fin antennae
- Cooling & HVAC systems
- Electronic control unit (ECU) input/output protection
- Load dump and other transient voltage protection
- Infotainment, telematics and navigation input/output protection

Mini-Breakers

(Miniature Thermal Protectors)

Types Available:

- Low current series (LC, NRC)
- High current series (HC, NRA, KCA)

Features:

- Overtemperature and overcurrent protection in a single device
- Resettable activation
- Temperature sensing capability
- Wide range of temperature options: 72°C, 77°C, 82°C, 85°C and 90°C
- Low resistance
- Small & thin size for compact package design
- Optimal corrosion resistant properties



Applications

Battery cell protection for:

- Notebook PCs
- Tablet PCs
- Smart phones
- Mobile phones
- Power banks

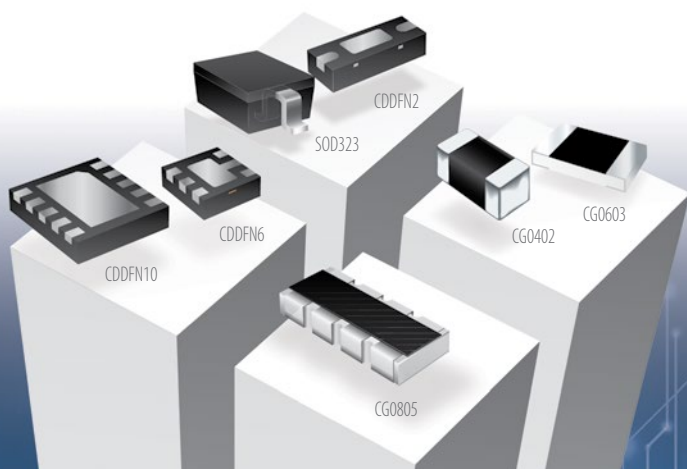
ESD Protection Solutions

Types Available:

- Transient voltage suppressor (TVS) diodes
- Transient voltage suppressor (TVS) diode arrays
- Steering diode arrays
- ChipGuard® ESD suppressors, multi-layer varistor, polymer and air-gap technologies
- Automotive grade ChipGuard® devices

Features:

- ESD protection to industry specification IEC 61000-4-2
- Minimum 8 kV contact and 15 kV air discharge ESD withstand
- Excellent high frequency response
- SMT Packages (0402, DFN2, 0603, 0805, 1206, DFN4, DFN6, DFN10, SOD323, SOT563, SC70-6, SOT23, SOT23-6, SOT143A, NSOIC 8L, NSOIC 16L & MSOP 10L)



Applications

- HMI, touch interfaces
- Automotive electronics
- Consumer electronics
- Appliances
- High-speed communication ports such as USB 3.0, IEEE1394, HDMI, Gb Ethernet
- Fast communication ports such as USB 1.1, 10/100b Ethernet ports
- RS232, RS422 & RS485 type applications

Automotive - AEC-Q200 qualified available

TBU® High-Speed Protectors

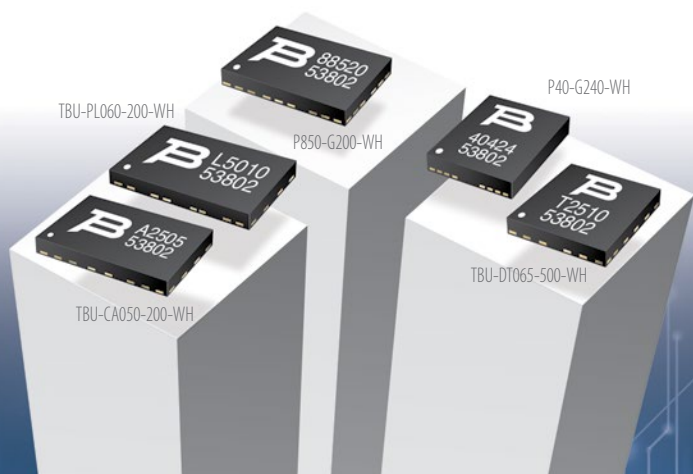
Introduction:

TBU® High-Speed Protectors (HSPs) are circuit protection devices designed to protect against faults caused by short circuits, AC power cross, induction and lightning surges.

The TBU® HSPs block surges, providing a barrier to sensitive electronics and eliminating exposure to large voltages or currents during surge events up to rated limits.

Features:

- Extremely high-speed performance
- Blocks high voltages & currents up to rated limits
- Exceptionally low let-through energy
- Very high bandwidth, GHz compatible
- UL recognized components
- Programmable models available



Applications

- POTS linecards
- VoIP equipment
- ONUs and ONTs
- Gateways and modems
- 10/100 & Gigabit Ethernet
- VDSL interfaces
- Remote metering & surveillance
- Rail and mass transit
- Industrial automation
- Test equipment
- RS232, RS422, RS485, CANbus and LVDS
- Sensors

TCS™ High-Speed Protectors

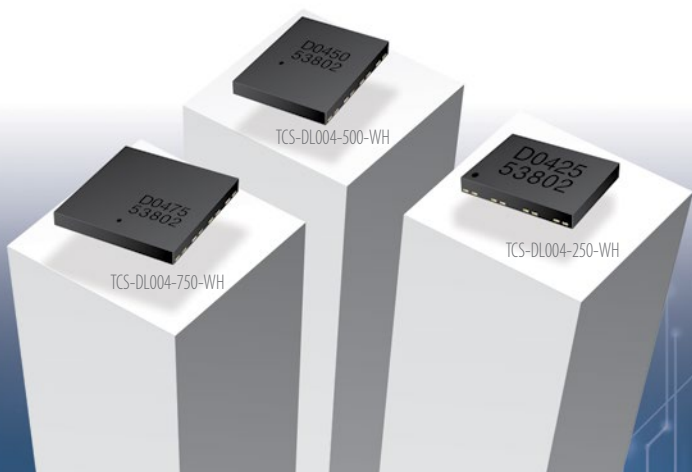
Introduction:

TCS™ High-Speed Protectors (HSPs) are circuit protection devices designed to protect against faults caused by short circuits, AC power cross, induction and lightning surges.

The TCS™ HSPs block surges, providing a barrier to sensitive electronics and eliminating exposure to large voltages or currents during surge events up to rated limits.

Features:

- Extremely high-speed performance
- Low let-through energy
- Very high bandwidth, GHz compatible
- UL recognized components



Applications

- ONUs and ONTs
- Gateways and modems
- 10/100 & Gigabit Ethernet
- VDSL interfaces
- Remote metering & surveillance
- Rail and mass transit
- Industrial automation
- Test equipment
- RS232, RS422, RS485, CANbus and LVDS
- Sensors

Multifuse® Polymer PTC freeXpansion™ Products

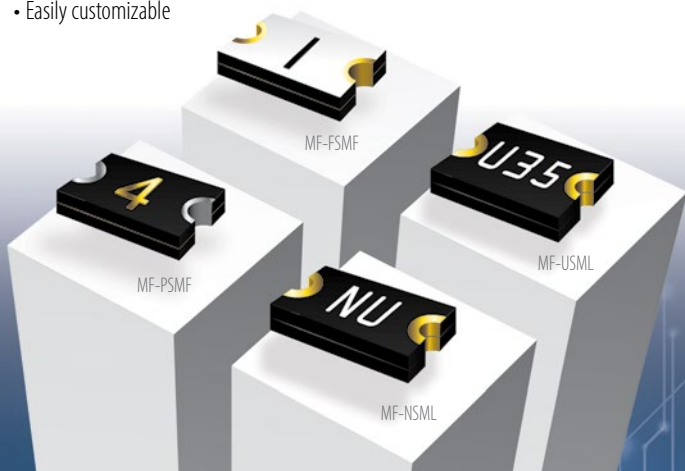
Types Available:

- MF-FSMF Series
(0603 / 1608 metric)
- MF-PSMF Series
(0805 / 2010 metric)
- MF-LSMF Series
(2920 / 7555 metric)
- MF-MSMF Series
(1812 / 4532 metric)
- MF-USMF Series
(1210 / 3225 metric)
- MF-NSMF Series
(1206 / 3216 metric)
- MF-SMDF Series
(2018 / 5050 metric)
- Easily customizable

Features:

Unique freeXpansion™ design provides:

- Greater resistance stability
- Smallest Bourns® PTCs
- Highest Bourns voltage withstand
- Highest Bourns hold current (I_{hold})
- Extended product life
- Low ohmic materials available in SMD for high hold current and low resistance applications
- High temperature material available in SMD for higher ambient temperatures



Applications

- USB 2.0, USB 3.0, USB 3.1 & HDMI port protection
- PC motherboards - plug & play protection
- Mobile phones - battery & port protection
- PDAs / digital cameras
- Industrial controllers
- Portable medical devices
(excluding critical life support)
- Portable memory
- Game consoles
- GPS navigation systems

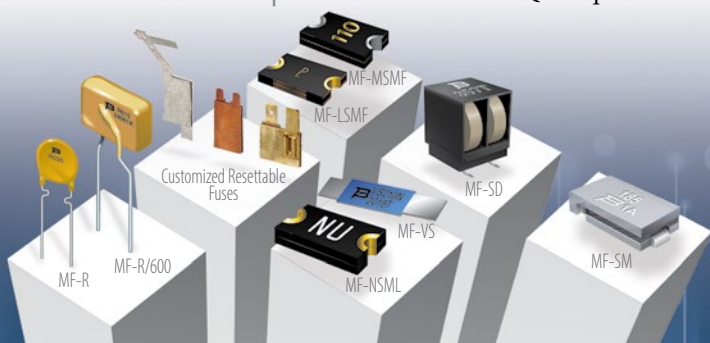
Multifuse® Polymer PTC Resettable Fuses

Types Available:

- Radial leaded through-hole
- Surface mount
(0603, 0805, 1206, 1210, 1812, 2018, 2920 & 3425)
- Axial leaded battery strap
- Unencapsulated disk

Features:

- 6 to 90 V operating voltages
- Hold currents from 50 mA to 11.0 A
- Agency approval - UL, CSA & TÜV
- Interrupt voltages of 250 V and 600 V with surge capabilities for assisting in meeting US and international telecom requirements
- High temperature polymers available with operating temperatures between -40°C and $+125^{\circ}\text{C}$
- Custom designs available upon request
- Bulk, embossed tape and ammo pack packaging
- RoHS compliant* standard & halogen free** upon request
- Some models AEC-Q200 qualified



Applications

- Computers
- Batteries
- Automotive
- Charging ports
- Telecommunications
- Industrial controls
- Portable electronics
- Medical products
- Point of Sale
- Game consoles and toys
- Security systems
- DC motors

(excluding critical life support)

*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

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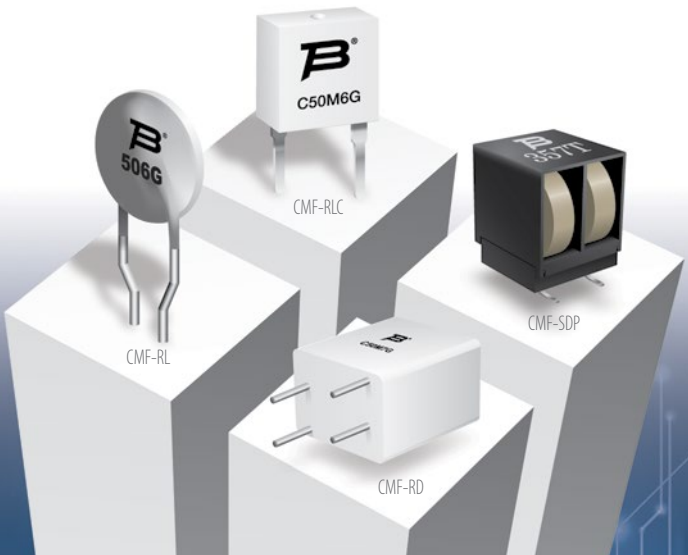
Ceramic PTC Products

Types Available:

- Radial leaded through-hole
- Surface mount
- Dual-packaged surface mount
- Dual-packaged radial leaded through-hole
- Unencapsulated disk or chip

Features:

- Aids compliance with:
 - ITU-T K.20/21/45
 - Telcordia GR-1089-CORE
 - UL 60950, 3rd Edition
- UL recognized
- Matching available with narrow resistance tolerance
- Alternative tolerances and resistances on request
- RoHS compliant*



Applications

Overcurrent protection for telecom applications:

- Customer premises equipment (CPE)
- Central office (CO)
- Access equipment POTS
- xDSL and integrated linecards
- PABX protection
- VOIP protection
- Set-top boxes

**RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.*

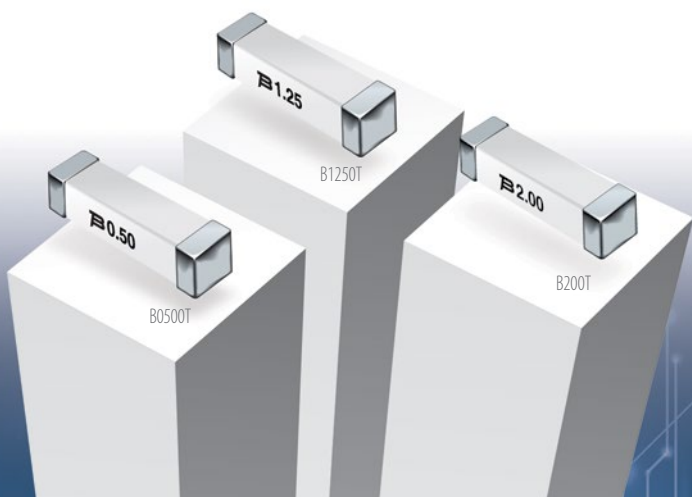
Telefuse™ Telecom Fuses

Types Available:

- Surface mount

Features:

- Telecom overcurrent protection
- Withstands lightning surge and AC power cross up to rated limits
- Assists in meeting Telcordia GR-1089 and UL 60950 specifications
- Operates safely under fault conditions
- RoHS compliant*



Applications

- Telecom circuit protection

**RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.*

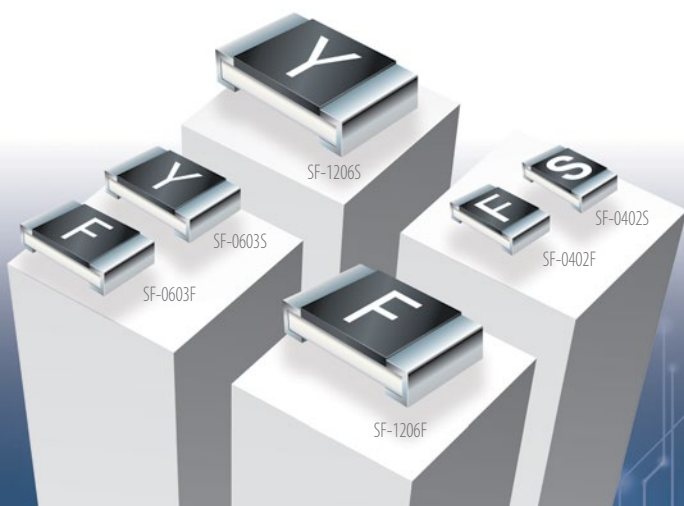
SinglFuse™ Thin Film Chip Fuses

Types Available:

- Fast-acting fuse
- Slow blow fuse
- Surface mount
- 3 available footprints:
0402 (1005 Metric)
0603 (1508 Metric)
1206 (3216 Metric)

Features:

- Single blow fuse for overcurrent protection
- UL recognized
- Surface mount packaging for automated assembly
- Thin film chip fuse
- RoHS compliant* and halogen free**
- Wide range of both fast & slow blow fuses in three product sizes



Applications

- Portable memory
- LCD monitors
- Disk drives
- PDAs
- Digital cameras
- DVD players
- Cell phones
- Bluetooth headsets
- Rechargeable battery packs
- Battery chargers
- Set-top boxes
- Industrial controllers

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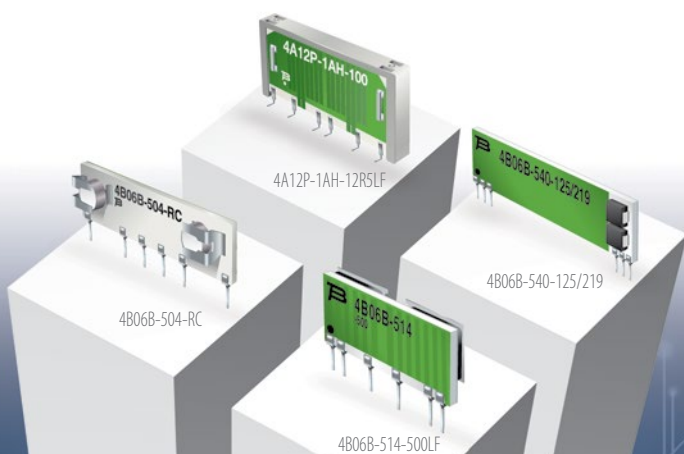
Line Protection Modules

Types Available:

- Through-hole
- Surface mount
- Multifunction modules
- One shot fuse options
- Resettable fuse options
- 1, 2 and 4 port options
- Custom designs available

Features:

- Precision tolerance overcurrent protection
- Resistance values from 5.6 - 100 ohms
- Withstands lightning surge and AC power cross up to rated limits
- Assists in meeting Telcordia GR-1089 and ITU-T K.20/K.21/K.45 specifications
- Operates safely under fault conditions
- Nonflammable
- UL 497A recognized



Applications

- Telecom circuit protection

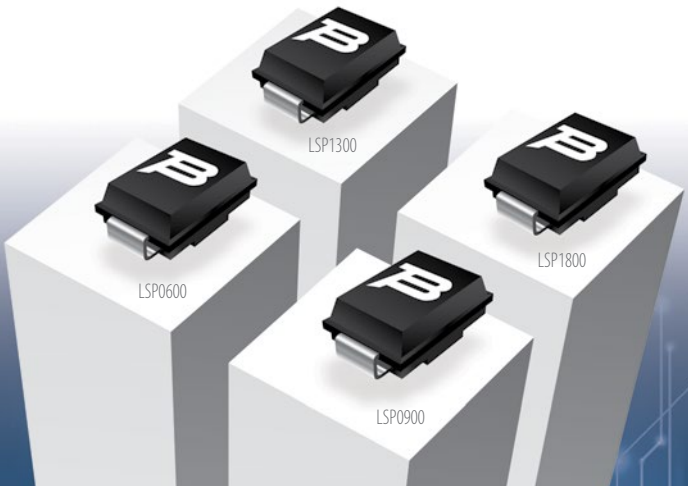
LSP Open LED Shunt Protectors

Types Available:

- SMB package
- SMA package

Features:

- Fast switching
- Industry standard, small footprint
- Suitable for industrial lighting environments
- RoHS compliant*
- Improved uptime of the end application by shunting / bypassing open-circuit LEDs in a series string
- Can assist with ENERGY STAR® compliance



Applications

- LED streetlights
- Avionics lighting
- High-bay industrial lighting
- Intrinsically safe lighting
- Low maintenance lighting

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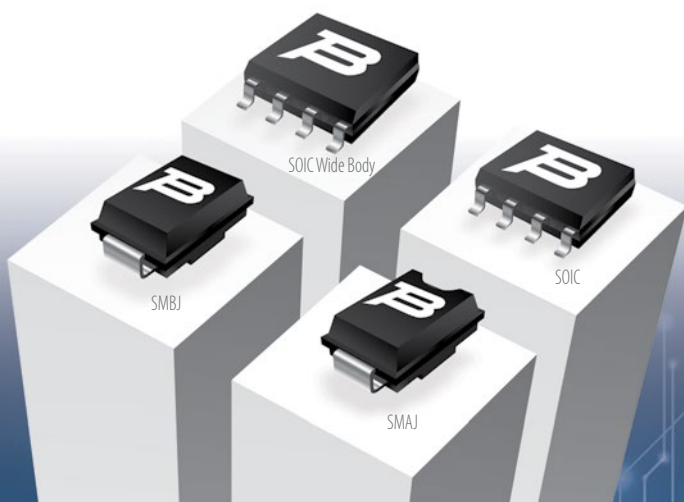
TISP[®] Thyristor Surge Protectors

Types Available:

- Unidirectional
- Bidirectional
- Programmable
- ACTP – AC Transient Protectors

Features:

- Protection voltages from 15 V - 700 V
- Dedicated SLIC protection
- Telephone port protection
- xDSL (including G.fast) protection
- UL recognized
- Assist with Telcordia GR-1089, UL 60950, FCC (TIA), ITU-T, IEC & YD/T compliance
- Offline AC power supply protection
- Specified in chipset reference designs for 15 years



Applications

- POTS protection
- VoIP protection
- xDSL protection
- ISDN and NT protection
- Central office, access network and customer premise equipment
- Modems, gateways and set-top boxes
- FTTx equipment
- Offline Switch Mode Power Supply (SMPS)

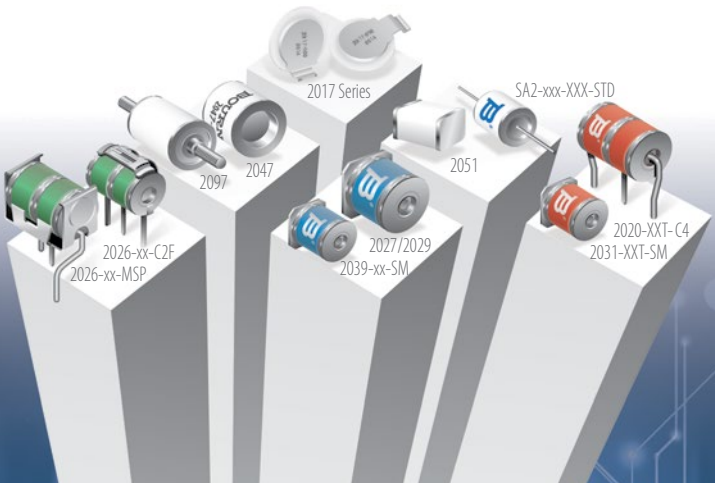
Gas Discharge Tubes

Types Available:

- Long life series
- Premium series
- Fast acting series
- High voltage series
- High current series
- Hybrid series
- FLAT® series

Features:

- 75 - 7200 V operating voltages
- 8/20 μ s surge current ratings of 2kA - 100kA
- Low capacitance
- Through-hole, surface mount packages available
- Switch Grade Fail-Short options
- Fast GDT versions available
- Low overshoot hybrid designs
- UL, Telcordia, REA, IEEE, ITU-T and IEC recognition
- RoHS compliant*



Applications

- Appliances
- Telecommunications
- Data communications
- CATV/broadband
- Industrial power ports
- Industrial and process controls
- Transportation signaling
- Consumer electronics

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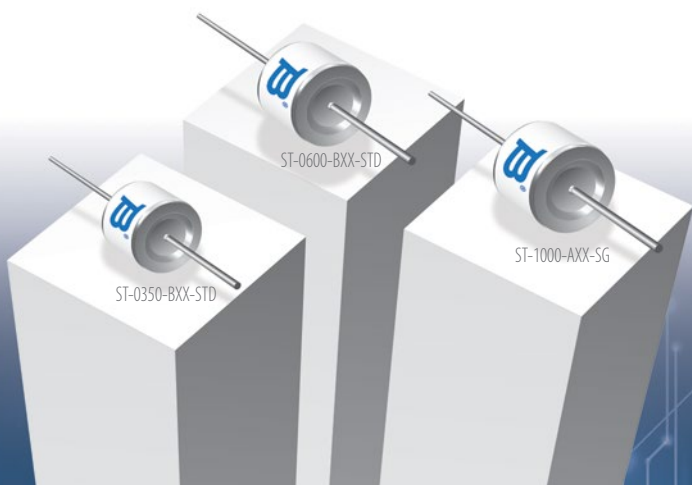
Sparctube™ Switching Spark Gap Devices

Types Available:

- ST-0350 series
- ST-0400 series
- ST-0470 series
- ST-0600 series
- ST-0620 series
- ST-0750 series
- ST-0800 series
- ST-0840 series
- ST-1000 series

Features:

- Fast switching rate
- High energy, low loss capability
- Wide operating temperature range
- Long service life
- High insulation resistance
- RoHS compliant*



Applications

- Igniters for architectural and automotive xenon discharge lamps
- Electronic igniters for gas heating and gas domestic appliances
- Ignition of ultra-high pressure gas discharge lamps for data and video projectors

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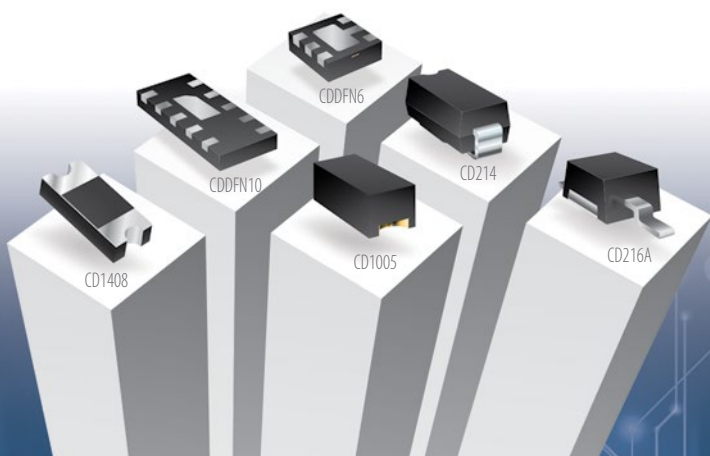
Diodes

Types Available:

- Transient voltage suppressor (TVS) diodes
- Transient voltage suppressor (TVS) diode arrays
- Steering diode arrays
- Switching diodes
- Schottky barrier diodes
- Schottky rectifier diodes
- Fast response rectifier diodes
- High voltage rectifier diodes
- Bridge rectifier diodes

Features:

- RoHS compliant*
- Surface mount devices
- Leadless - DFN2, DFN4, DFN6, DFN10, 0603, 1005, 1206, 1408, 1607, 2010 & 2320 packages available
- SMA, SMB, SMC, SOT563, SC70-6, SOT23 & SOT23-6 packages available
- 8L & 16L NSOIC, 16L WSOIC & 10L MSOP packages available
- Tape & reel packaging



Applications

- Appliances
- Portable electronics
- Desktop PCs & notebooks
- Digital cameras
- MP3 players
- Base stations
- Port protection (USB 1.x, 2.0, 3.x, Ethernet, HDMI, RS comm ports, etc.)

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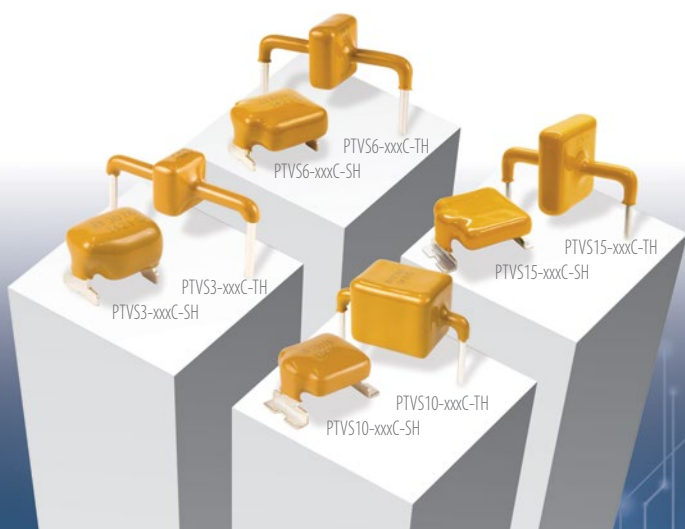
Power TVS Diodes

Types Available:

- Surface mount
- Axial lead

Features:

- Robust lightning protection
- 3, 6, 10 & 15 kA peak current rating
- Rigid voltage clamp
- Voltages from 15 V to 430 V
- Simple design
- Axial lead and surface mount packages
- Common PCB footprint for all axial lead devices
- RoHS compliant*



Applications

- AC and DC input power line protection in hostile environments
- High reliability applications requiring high energy surge protection and a rigid voltage clamp
- Telecom base station equipment
- Street lighting
- Industrial equipment
- Solar inverters

*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

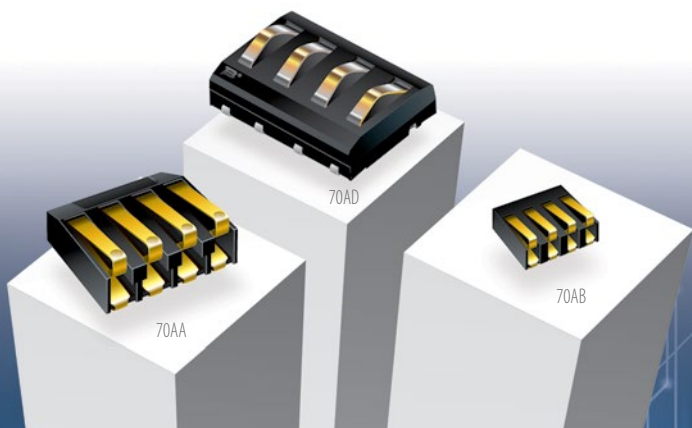
Modular Contacts

Types Available:

- Male
- Female

Features:

- Precious metal contacts
- 2 – 6 contacts
- 1.27 mm, 2.54 mm, 4.0 mm pitch, 10,000 cycles
- Through-hole and surface mount
- Normal force:
 - 70AB - 40 grams minimum
 - 70AA - 80 grams minimum
 - 70AD - 100 grams minimum
- Contact resistance – < 0.030 ohms
- Tube, embossed tape, 13 " reel packaging
- RoHS compliant*
- Halogen free**



Applications

- Cellular phones
- Docking stations
- PDAs
- Laptop computers
- Rechargeable battery packs
- Medical devices
(excluding critical life support)

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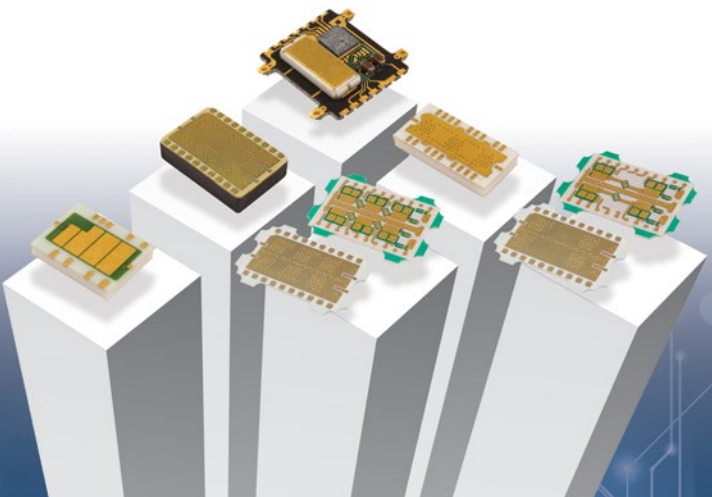
SEMS: Specialty Engineering & Manufacturing Services

Types Available:

- Single in line
- Dual in line
- SMT
- Ball Grid Array (BGA)
- Custom

Features:

- Custom IC & MCM packaging
- High density thick film
- Fine pitch SMT
- Chip & wire
- Flip chip
- Stud bump bonding
- RF packaging



Applications

- Telecommunications
- Optic assemblies
- Instrumentation
- Industrial sensors & controls
- Medical equipment
(excluding critical life support)
- RF/wireless
- Automotive

Inductors & Transformers

Types Available:

Power Inductors

- Non-shielded
- Semi-shielded
- Shielded
- High current shielded
- High current toroids
- Dual chokes
- Flat wirewound

Chip Inductors

- Molded wirewound
- Multilayer ceramic
- Multilayer ferrite
- Open wirewound

Transformers

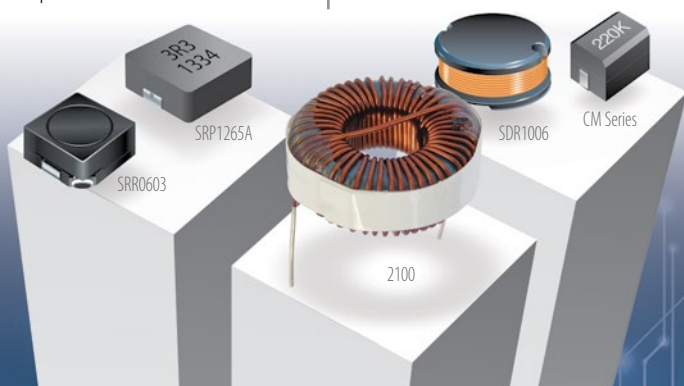
- Line-matching
- Wideband
- ISDN
- xDSL
- LAN
- PoE/VoIP

Chip Beads

- High current
- High impedance

Features:

- Standard inductance values from 1.0 nH to 500 mH
- 14 models of chip inductors
- More than 150 models of surface mount power inductors
- More than 50 models of through-hole power inductors
- Available in a wide range of sizes
- Low profile down to 0.9 mm
- Operating temperature as high as 200 °C
- Sealed and open construction
- Saturation current up to 118 A
- AEC-Q200 qualified



Applications

- Automotive (AEC-Q200 qualified)
- Battery chargers
- CD players
- Data communication
- DC/DC converters
- Global positioning systems
- Internet equipment
- LED drivers
- Local area networks
- Monitoring equipment
- Portable radios
- Portable tools
- SSD (Solid State Drives)
- Switch mode power supplies
- Test equipment
- Televisions
- Video conferencing equipment
- Telecommunications
- Wearables

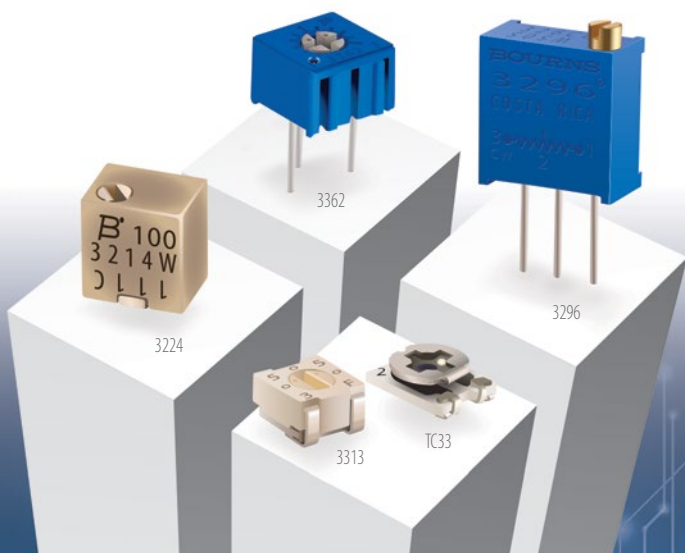
Trimpot® Trimming Potentiometers

Types Available:

- Surface mount
- Through-hole
- Single-turn
- Multiturn
- Sealed
- Open frame
- MIL-SPEC

Features:

- Top, bottom, side, front and back adjust
- 2 mm to 12.7 mm sizes
- Tube, bulk, embossed tape, ammo pack, radial tape and reel
- Compatible with pick and place equipment



Applications

- Blood chemical analyzers
- Communication equipment
- Medical meters
- Scanners
- Temperature & respiratory monitors
- GPS navigation
- Portable/handheld radios
- Satellite systems
- Set-top boxes
- Automation equipment
- Automated gates/doors
- CCTV cameras
- Fire alarms
- Fluid measurements
- Industrial/graphic printers
- Laser diode drivers
- Metal detectors
- Proximity sensors
- Relays
- RFID systems
- Smoke detectors
- Calibration equipment
- Network analyzers
- Oscilloscopes
- Radiation & X-ray testers
- Transmission equipment
- Analytical equipment
- Avionics
- Laser altimeters
- Military radios
- Radar systems

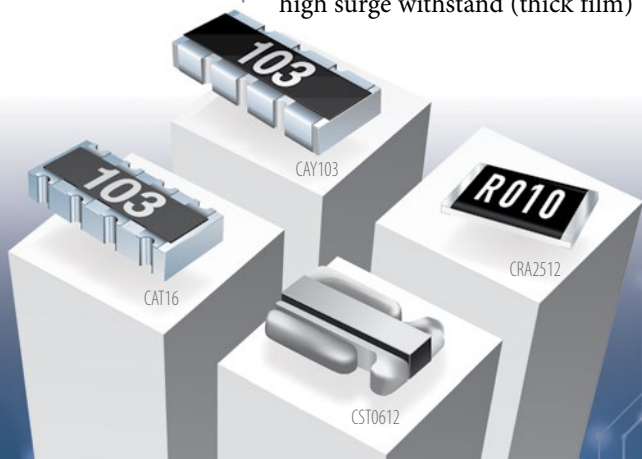
Chip Resistors & Chip Arrays

Types Available:

- Thick film chip arrays
- Thick film chip resistors
- Thin film chip resistors
- Metal strip chip resistors
- Sulphur proof available

Features:

- Standard resistance values from 0.0005 ohms to 10 megohms
- Standard resistance tolerances 0.01 % (thin film only), 1.0 % & 5.0 %
- Chip resistors: 0201-size to 2512-size
- Chip arrays: 0402 x 2 to 0603 x 8-size
- Operating temperature range of -55 °C to +170 °C (metal strip)
- Power up to 3 W (metal strip)
- 4-terminal 0612 size (metal strip)
- AEC-Q200 qualified, automotive grade (metal strip)
- UL1676 listed high voltage and high surge withstand (thick film)



Applications

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> • Automotive • Current sense • Cellular and cordless phones • Communications interface • Flashlights • High voltage applications | <ul style="list-style-type: none"> • Intercom systems • Internet telephony • Local area networks • Measurement equipment • Memory modules (incl. anti-sulfur type) • Portable digital assistants • Portable tools | <ul style="list-style-type: none"> • Power supplies: DC/DC; AC/DC; DC/AC • Pulse power applications • Remote controllers • Telecom switching devices • Test equipment • White goods |
|---|--|---|

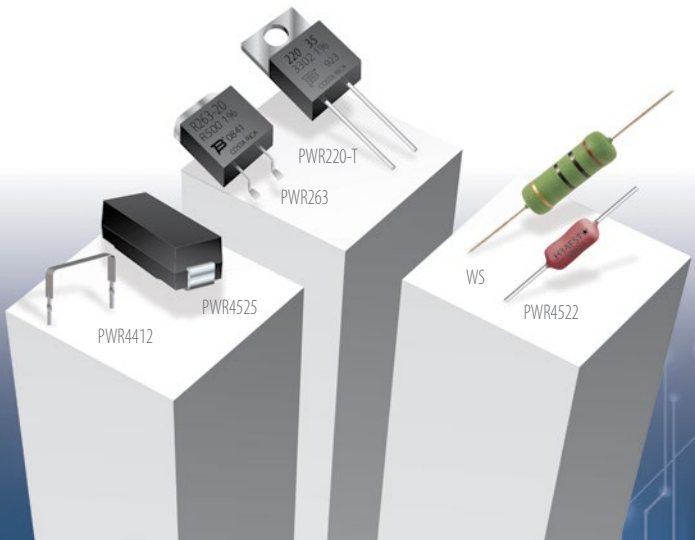
Power Resistors

Types Available:

- Bare metal open air shunts
- High surge withstand and UL1412 listed safety fusible wirewound resistors
- Shunt resistors
- Surface mount wirewound resistors
- Surface mount and through-hole TO-220 and DPAK packaged resistors

Features:

- Through-hole and surface mount
- 0.002 ohms to 130k ohms
- 0.5 watts to 35 watts
- 0.5 % to 5 % tolerances
- Operating temperature up to +275 °C
- AEC-Q200 qualified (TO-220 and DPAK packaged resistors)
- Excellent surge performance



Applications

- Automotive
- AC power supplies
- Battery controls
- Combiners
- Isolators
- Motor controllers
- LED lighting
- Renewable energy
- Smart meters
- Surge protection
- White goods

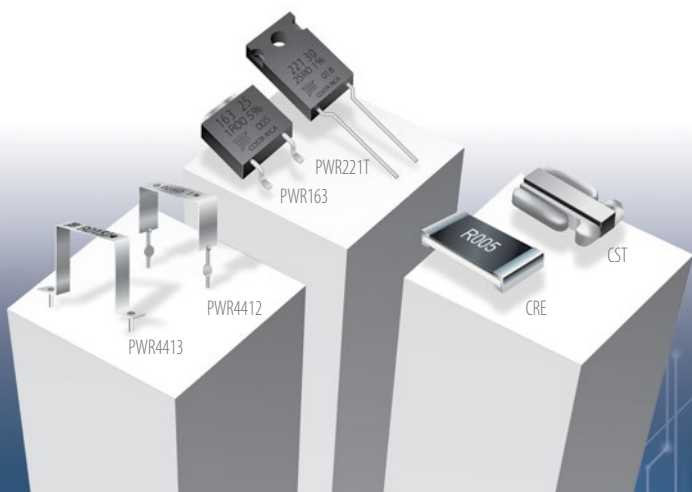
Current Sense Resistors

Types Available:

- High power thick film chip
- High power metal strip chip
- Bare metal open air
- High power TO-220, DPAK

Features:

- Through-hole and surface mount
- 2 and 4 terminal
- 0.0005 ohms to 100k ohms
- 0.1 watts to 35 watts
- Chip resistors 0603-2512 up to 3 watts
- 1 % to 5 % tolerances
- AEC-Q200 qualified (TO-220, DPAK and metal strip chip packaged resistors)



Applications

- Power supplies
- Stepper motor drives
- Battery packs
- White goods
- Input amplifiers
- Precision circuits
- Medical equipment
(excluding critical life support)
- Printers
- Automation equipment
- Navigation equipment
- Automotive

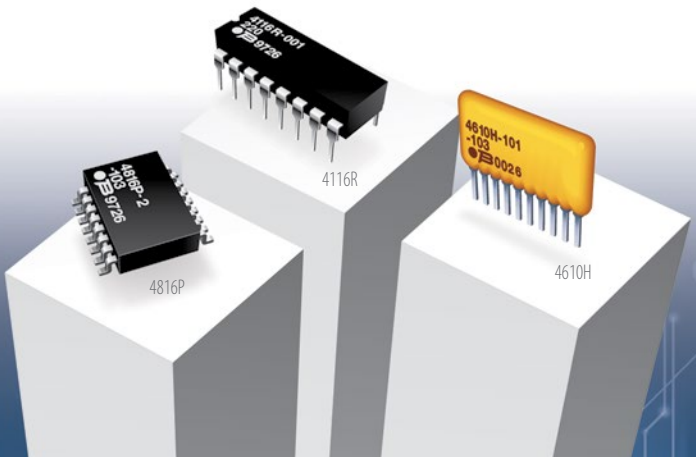
Resistor & RC Networks

Types Available:

- Thick film resistor networks
- Thin film on ceramic resistor networks
- Resistor/capacitor (RC) networks
- Capacitor networks
- Tin lead plating available on some models

Features:

- Surface mount and through-hole mounting
- SIP and DIP packages
- Molded and conformal-coat packages
- Standard resistance values from 10 ohms to 10 megohms
- Custom networks for non-standard circuits and values
- SIP package height as low as 0.195 inch
- Operating temperature range of -55°C to $+125^{\circ}\text{C}$
- AEC-Q200 qualified (4800P Series)



Applications

- Access equipment
- Bar code scanners
- Cable boxes
- Computer peripherals
- Consumer electronics
- Data communication
- Fax equipment
- Modems
- Monitoring equipment
- Portable power generators
- Power supplies: DC/DC; AC/DC; DC/AC
- Satellite systems
- Telecom switching devices
- Test equipment

Commercial Panel Controls & Encoders

Types Available:

Panel Controls

- Rotary
- Motorized rotary

Encoders

- Incremental contacting

Mounting Options

- Bushing • Bushingless
- PC mount • Solder lug

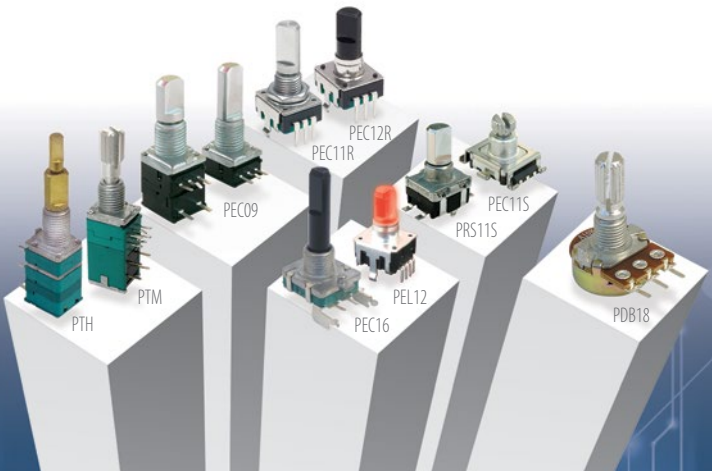
Features:

Sizes (vary by model)

- 9 to 24 mm (rotary panel controls)
- 12 and 16 mm square (encoders)

Options

- Panel controls:
 - Several taper options
 - Rotary switch option†
 - Multi-cup option†
 - Push/pull switch option†
- Encoders:
 - Momentary push switch
 - Detents available on some resolutions



Applications

- Kitchen appliances
- Communications equipment
- Irrigation controls
- Portable electronics
- Test and measurement instrumentation
- Medical equipment (excluding critical life support)
- Power tools

† available on some models

Industrial Panel Controls

Types Available:

- Rotary

Mounting options

- Bushing
- PC mount
- Snap-in
- Reverse audio

Terminal Styles

- PC pins
- Solder lugs

Features:

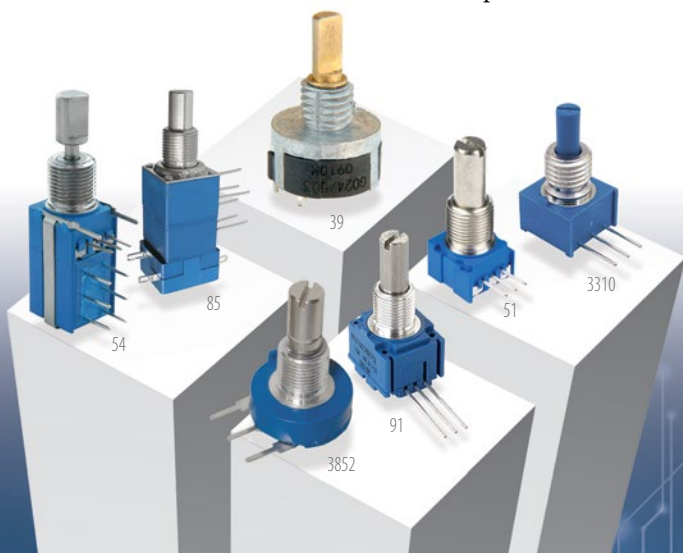
Output

- Linear taper
 - Audio taper
 - Custom taper
- ### Sizes (vary by model)

- 9 to 23 mm

Options

- Flexible lead-wires
- Rotary switch option†
- Multi-cup option†
- Boardwash seal option†



Applications

- HMI (Human-machine interface)
- Test and measurement instrumentation
- Medical instrumentation and equipment
(excluding critical life support)
- Irrigation controls
- Video conferencing equipment
- Industrial equipment controls
- Environmental test equipment
- Avionics and aerospace
- Military grade equipment

† available on some models

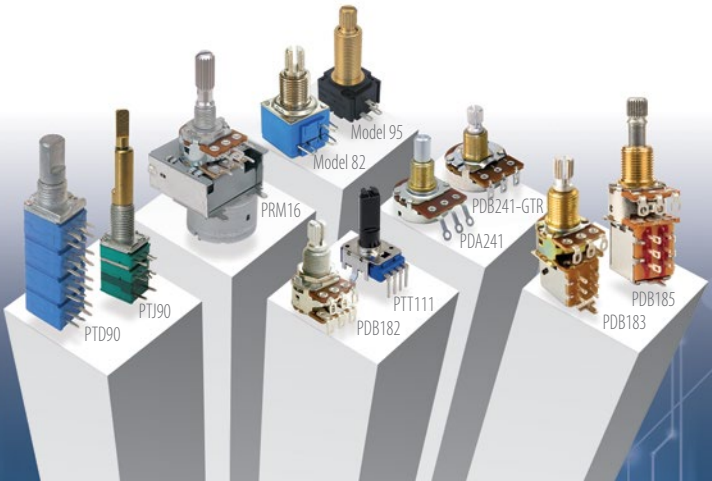
Pro Audio Products

Types Available:

- Rotary

Features:

- Flatted, knurled or plain shafts
- Metal and plastic shafts
- Splash seal
(available on some models)
- Various standard resistance codes
- Various standard tapers
- PC pin and solder lug options
(available on some models)
- Dual concentric shafts (Model PTJ90)



Applications

- Electric guitars
- Bass guitars
- Instrument amplifiers
- Audio mixing consoles
- Video mixing boards
- Broadcast consoles

Commercial Slide Potentiometers

Types Available:

- Manual
- Motorized
- Open frame & metal housing

Features:

- Sizes (vary by model):
 - 10 mm to 100 mm
- Options
 - Dust covers (available on some models)
 - Single and dual gang
 - Various lever styles and lengths
 - Touch sense track (Model PSM)



Applications

- Audio mixing consoles
- Video mixing boards
- Broadcast consoles
- Pro lighting boards
- Medical equipment (excluding critical life support)
- Test and measurement instrumentation

Industrial Encoders

Types Available:

- Incremental contacting
- Incremental magnetic
- Absolute contacting
- Absolute/PWM magnetic
- Incremental optical

Mounting options

- Bushing
- PC board
- Snap-in
- Servo

Features:

Resolution

- Contacting – 6 PPR to 36 PPR options
- Optical – 25 PPR to 256 PPR options
- Magnetic – 32 PPR to 512 PPR and 1024 PPR states options

Sizes (vary by model)

- 9, 16, 22 mm square & 16 mm x 22 mm

Options

- Detents†
- Momentary push switch†
- Shaftless versions†
- Sealable to IP 65 & 67†



Applications

- Audio/visual equipment
- Household appliances
- Communications equipment
- Industrial heavy equipment
- Medical equipment (excluding critical life support)
- Test and measurement instrumentation
- Scanners and copiers
- Robotics
- Forklifts and material handling

† available on some models

Rotary Position Sensors

Types Available:

- Rotary

Mounting options

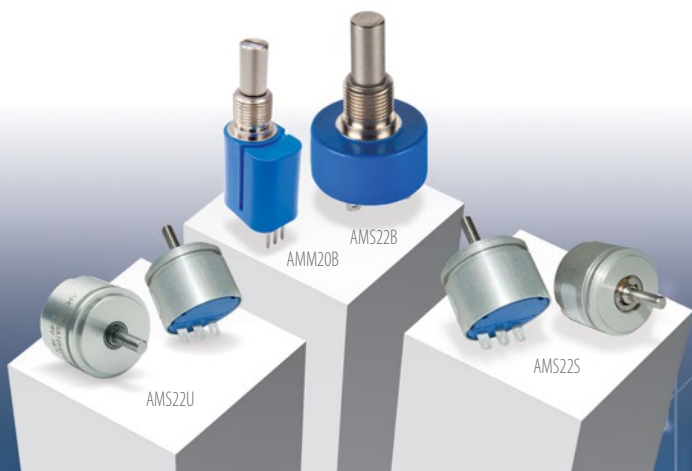
- Bushing
- Servo mount

Terminal Styles

- PC pins
- Solder lugs
- Solder eyelets
- Insulated flexible wire leads*

Features:

- Non-contacting “Hall Effect” technology
 - Single & multiturn models available
 - Seal option available on some models
- ### Output
- Analog
 - Pulse-width modulation (PWM)*
 - Serial peripheral interface (SPI)*
 - Synchronous serial interface (SSI)*
- ### Sizes (vary by model)
- 20 mm and 22 mm diameter



Applications

- HMI & MMI (Human-Machine & Machine-Machine Interface)
- Construction & agricultural vehicles
- Clean energy equipment

- Material handling equipment
- Automated packaging and processing equipment
- Medical diagnostic & patient care equipment

(excluding critical life support)

** available as custom option*

- Factory automation & assembly equipment
- Stage production & robotic lights

Precision Controls

Types Available:

- Rotary
- Digital push-button
- Single and multiturn

Mounting options

- Bushing
- PC mount
- Snap-in
- Servo mount

Terminal Styles

- PC pins
- Solder eyelets
- Turret terminals
- Insulated flexible wire leads

Features:

Output

- Linear
- Custom taper
- Audio taper
- Reverse audio

Sizes (vary by model)

- 13 to 51 mm diameter

Options

- Clutch
- Rotary switch option†
- Multi-cup option†
- Boardwash seal option†
- Sideload capability†



Applications

- HMI & MMI (Human-Machine & Machine-Machine Interface)
- Communications equipment

- Test and measurement instrumentation
 - Amplifiers
 - Medical instrumentation and equipment
- (excluding critical life support)*

- Industrial equipment controls
- Environmental test equipment
- Actuators
- Avionics
- Military

† available on some models

Turns-Counting Dials

Types Available:

- Concentric dial

Features:

Materials

- Metal (industrial)
- Plastic (commercial)

Turns

- Up to 20 turns available

Sizes (vary by model)

- 22 to 46 mm

Options

- Black face and silver face dials available
- Locking brake



Applications

- Power supplies
- Test and measurement instrumentation
- Medical instrumentation and equipment
(excluding critical life support)
- Industrial equipment controls
- Environmental test equipment
- Automation control panels

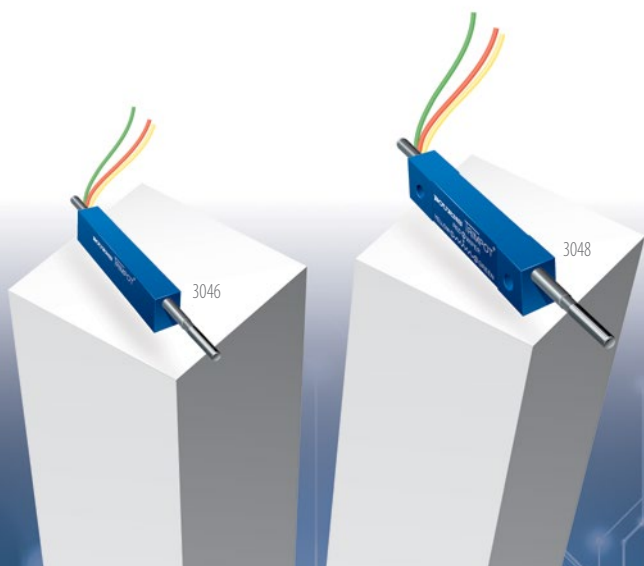
Linear Motion Potentiometers

Types Available:

- Rectangular body
- Flexible lead
- Conductive plastic element

Features:

- 0.12 to 0.25 watt power ratings
- 3.81 mm to 12.7 mm stroke lengths
- 500,000 cycles actuation life
- 1k ohm to 50k ohm standard resistance values



Applications

- Position sensing
- Copy machine cassette paper size selectors
- Infusion pumps
- Rear view mirror position feedback

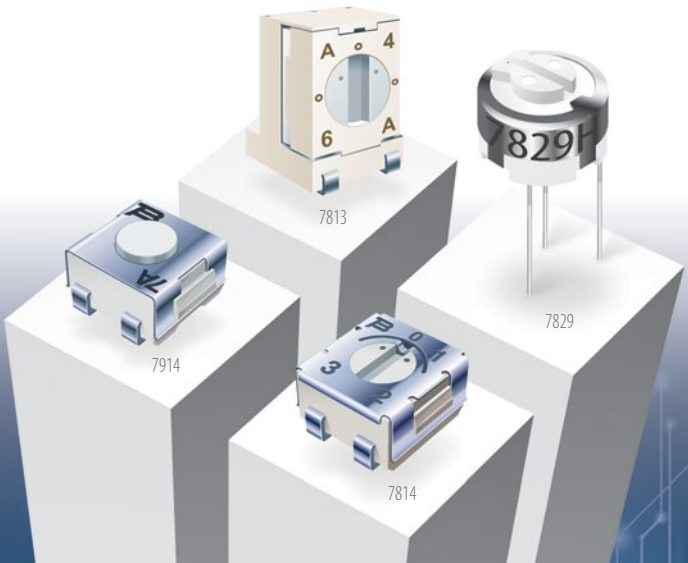
Switches

Types Available:

- Rotary
- Tactile

Features:

- Surface mount and through-hole mounting
- PC pins, gull wing, and J-hook terminal styles
- Sealed and boardwashable types
- 3, 4, and 6 mm sizes
- Tube and embossed tape carrier packaging



Applications

- Instrumentation
- Industrial controls
- Sensors
- Proximity sensors
- Test equipment
- Temperature sensors
- Communications equipment
- Computers
- GPS
- Telecommunications
- Security systems
- Appliances
- Automotive
- Audio/visual

Surge Protective Devices

Types Available:

- 1, 2, 3 & 4 pole
DIN Rail mountable
- N-Type connector
- F-Type connector
- Residential enclosure
- Commercial enclosure

Features:

AC Surge Protective Devices

- Pluggable
- DIN Rail type
- 50 kA - 100 kA rated

DC Surge Protective Devices

- 12 V, 24 V, 48 V, 75 V or 110 V
DC power

Signal & Data Line Protective Devices

- Gigabit Ethernet
- T1/E1 applications
- RS-232, RS-422, RS-423, RS-485,
20 mA and 50 mA instrument loops

Coaxial Surge Protective Devices

- RF applications from
DC-1 GHz, 50 ohms



Applications

- UHF, VHF transmitters
- 2-way base stations
- Ethernet
- Transceivers
- Antennas
- Broadband
- Microwave
- GPS
- Cellular
- CATV
- Satellite video
- Residential enclosures
- Commercial enclosures

Central Office & Outside Plant Products

Types Available:

- Protection - 5-pin modules:
 - 3-type overvoltage only
 - 4-type overvoltage and sneak current
- Station protection
- Network interface devices
- Digital subscriber line (DSL) products
- Protection connector blocks
- Terminal blocks

Features:

- Surge protection
- Modular units
- UL listed
- RUS and Telcordia compliant



Applications

- Telecommunications
- Voice, data, network lines
- Outside plant
- Customer premises
- Telephony
- Central office
- Building entrances
- Transportation
- Industrial process control
- Military premises

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