

AUTOMOTIVE PRODUCTS MARCH 2019



**POWER
SOLUTIONS**

● INDUCTORS

● GATE DRIVE
TRANSFORMERS

● COMMON
MODE CHOKES

● SWITCH MODE
TRANSFORMERS

● CURRENT SENSE
MAGNETICS

Pulse Electronics Power BU provides a full, integrated set of automotive application solutions to meet the needs of automotive manufacturers. With our components, businesses can optimize product performance and increase efficiency.

What sets Pulse apart is:

- A demonstrated design/engineering
- High volume production capability
- Outstanding quality performance
- Geographic proximity to customers' design and production sites
- Global Distribution channel support





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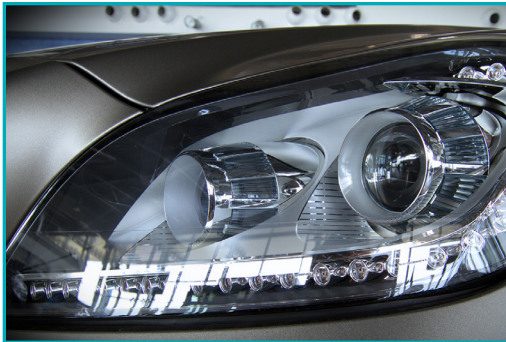
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- Door Power Module

**PM2160/61**

- Feed forward flyback technologies
- Optimized using finite element analysis
- Functional and Basic Insulation

- Lighting & Vision Systems

**PA434x "A" Series**

- Extended operating temp range (-55C to +155C)
- Automated Manufacturing for Outstanding Quality
- Low profile construction down to 2.0mm Max
- High energy storage density using soft saturation material to prevent thermal run away

- Adaptive Cruise Control

**PM220x Series**

- Soft saturation characteristics
- Multiple competitive cross references available
- Handles high transient current spikes without saturation
- Molded construction to eliminate audible noise

APPLICATIONS

- Start-Stop Systems



PM2155

- IEC 60950 & 61558 Basic Insulation
- Patented Sidecar Package
- 12mm creepage in low profile SMD package
- For 4Kv isolation (600VRrms continuous)

- Electric Power Steering



PM2175

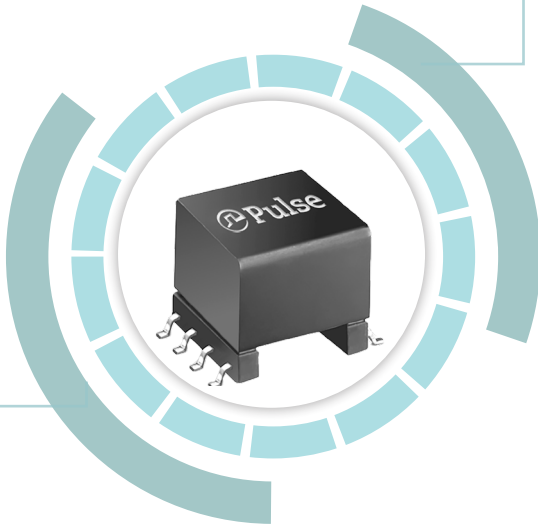
- Common Mode Choke
- Dielectric strength: 1500VRms
- Footprint: 19.3mmx18.2mm
- Wide range of impedance curves to solve noise issues

- On-Board Charging



PM2165

- Low profile
- EE5 Construction
- High Frequency (50KHz to 1MHz)
- Up to 20A Power Rating with ultra-low resistance of <750uOhms



HIGH FREQUENCY Wire Wound Transformer

PM2160 & PM2161

Our new EP13 Plus platform delivers over 30% more power handling capability than the industry standard EP13 platform in the same PCB footprint. This catalog series of 12, switch mode transformers is designed for multiple input voltage ranges (9-57v and 33-57v) and can provide six different output voltage combinations from 3.3v to 24v.



■ Features and Benefits

- Industry Standard Footprint
- Functional and Basic Insulation
- 1500Vrms Isolation, Up to 70W
- Forward and Flyback topologies
- Higher power density > 25%
- Designed using Finite Element Analysis for optimized performance

■ Applications

- Datacom
- Computing
- DC/DC Converter
- Power Over Ethernet

■ Series

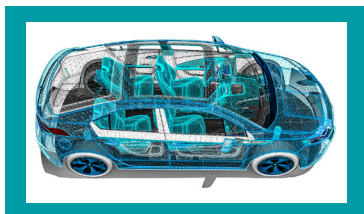
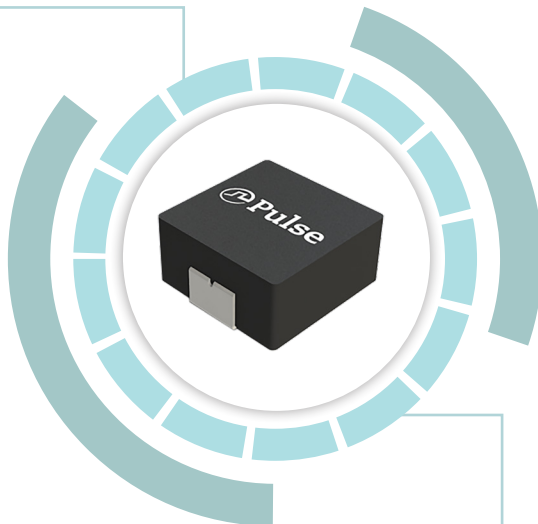
- 17.7mm x 14.5mm x 14mm
- Up to 70W
- 3.3, 5.0, 12, 24 and 48V outputs available

HIGH CURRENT

Molded Power Inductor

PA434XANLT

The PA434X is our latest series of AEC-Q200 qualified, high current, low profile, molded power inductors. As part of our extensive family of power inductors, the PA434X series boasts the highest energy density of any of Pulse inductor product. This new inductor series includes PA4340, PA4341, PA4342, PA4343, PA4344, PA4345, PA4546, PA4547 & PA4548— 9 footprints, ranging from 17x17 down to 6x6mm and a low 2.0mm minimum profile.



■ Features and Benefits

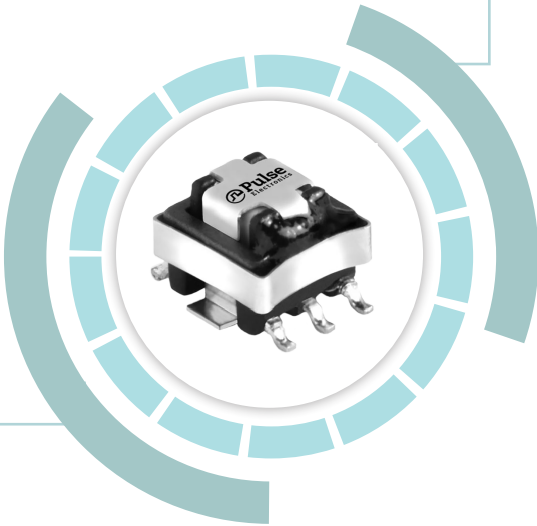
- Multiple Competitive Cross References
- High Current and Lowest DCR
- Molded Construction
- High Energy Storage Density
- Low Profile and Thin
- Automated Manufacturing for Outstanding Quality
- Competitive Pricing
- Extended operating temp range (-55C to +155C)

■ Application

- Mobile Computing
- Laptops
- LCD Displays
- Computer Server
- Hand-held Devices
- Networking/Telecom
- LED Lighting
- Portable POS

■ Series

- Industry standard form factors from 6 x 6 to 17 x 17mm with height profiles as low as 3mm
- Up to 62A



SMT CURRENT Sense Transformer

PM2165

A low profile, high frequency SMT Current Sense Transformer for use in a variety of high-reliability AC/DC, DC/DC, and DC/AC circuits where footprint and power handling ability are key considerations.



■ Features and Benefits

- AEC-Q200 Qualified
- High Frequency (50KHz to 1MHz)
- Low Profile
- Up to 20A Power Rating

■ Applications

- EV Charging
- Switch Mode Power Supplies
- Renewable Energy Inverters
- Industrial Inverters and Motor Control
- Uninterrupted Power Supplies (UPS)

■ Series

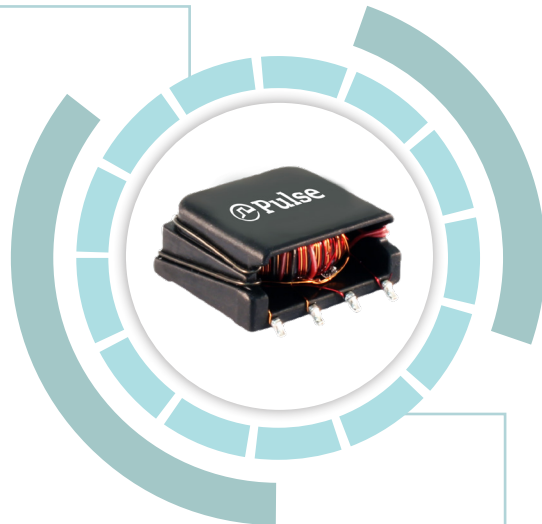
- 8.4mm x 7.2mm x 5.5mm
- Up to 20A

HIGH ISOLATION

Push Pull Transformer

PM2155

These switch mode power supply transformers are built with a unique Sidecar package that has the coil inserted at one side of the open package and the high isolation pins placed on the other side. This configuration separates the coil and pins so there is greater distance between the coil and pin to satisfy high isolation requirements (UP to 4Kv or 5Kv). It also enables the package to be smaller while still maintaining an optimal creepage distance. They are available in tube and tape-and-reel packaging.



■ Features and Benefits

- AEC-Q200 Qualified
- High Frequency (50KHz to 1MHz)
- Low Profile
- Up to 20A Power Rating
- Patented "Sidecar" technology providing high isolation in low profile package

■ Applications

- EV Charging
- Switch Mode Power Supplies
- Renewable Energy Inverters
- Industrial Inverters and Motor Control
- Uninterrupted Power Supplies (UPS)

■ Series

- 16mm x 17mm x 7.5mm

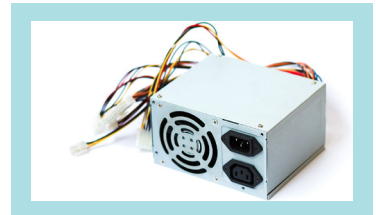


SMT COMMON

Mode Choke Series

PM2175

Chokes are one of the more common electronic components used to block high-frequency alternating currents, yet allow low-frequency direct currents to pass through in electrical circuits. Common Mode Chokes (also referred to as “CM Chokes”) are a type of choke that get their name from their ability to impede common mode currents. They differ from many other chokes in that they typically use two coils wound around a single core instead of just one. Their primary purpose is to eliminate potential malfunctions in electronic devices and interference in power supply lines — specifically radio frequency interference (RFI) and electromagnetic interference (EMI).



■ Features and Benefits

- AEC-Q200 Qualified
- High Frequency (50KHz to 1MHz)
- Up to 5A Rating
- High Impedance for excellent common mode rejection
- 1500Vrms Hi-pot

■ Applications

- EV Charging
- LED Lighting
- Switch Mode Power Supplies
- Renewable Energy Inverters
- Industrial Inverters and Motor Control
- Uninterrupted Power Supplies (UPS)

■ Series

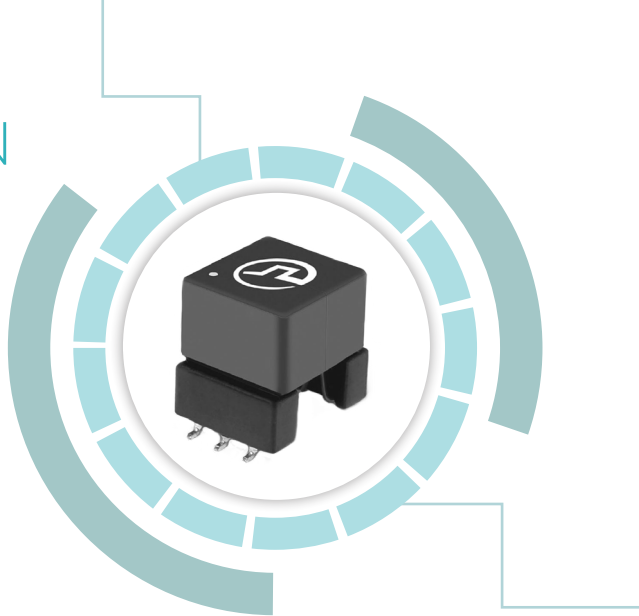
- 19mm x 18mm x 23mm
- Vertical platform minimizes board area

EP7 HIGH ISOLATION

SMT Transformer

PM2190

The Industrial communications bus can have multiple access points spread over a wide distance. Large ground loops and electrically noisy environments can create hazardous voltages which have implications for operator safety, protection of peripheral devices, and preserving the communications performance. Signal isolation can be built into the IC, however for higher isolation and efficiency an external isolated power supply is still required to power the transceiver, and the Pulse PH9185 series is ideally suited for this purpose.



■ Features and Benefits

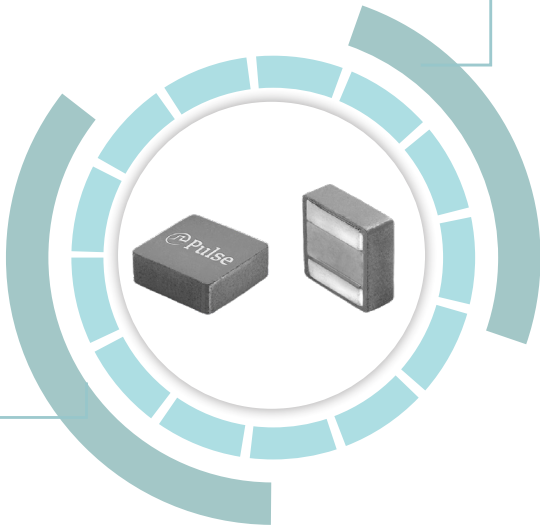
- High Isolation (5,000 Volts)
- 8mm Creepage
- Up to 3 Watts
- Meets EIA 481
- Certifications Include:
 - UL 60950-1
 - CAN/CSA C22.2 # 60950-1-07
 - TUV EN61558-1 and EN61558-2-16
- Competitive Pricing
- All products are RoHS compliant
- Tape Reel Packaging

■ Applications

- Industrial Control
- PLC & IO Modules
- IGBT and MOSFET Drivers
- Building Automation
- Smart Grid
- Renewable Energy
- Surveillance Systems

■ Series

- 10mm x 10mm x 12.5mm
- Multiple Turns Ratios available from 1:1 to 8:3

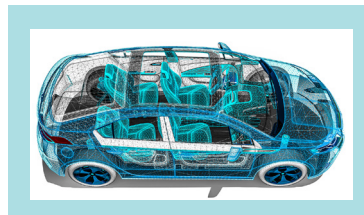
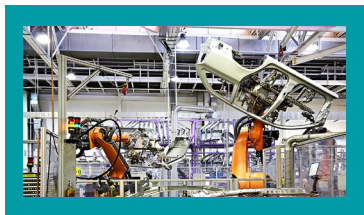


HIGH CURRENT

Composite Inductors

PA500x, PM220x, PM2240 and PM5175 series

Our composite core inductors come in multiple platform sizes and provide a fully shielded, high energy storage, soft saturation solution for applications up to 32Apk current. The construction enables the highest energy density of any available SMT inductor and also minimizes acoustic noise. With both commercial grade (-40C to 125C) and automotive grade (-55C to 155C) offerings they cover a wide range of applications and markets including Datacom, Computing, Industrial and Automotive.



■ Features and Benefits

- Low Profile, High Current flat wires
- Lowest DCR per mm³
- Soft saturation characteristics
- Larger terminations for lower DCR and stronger solder joint
- Excellent temperature stability
- Handles high transient current spikes without saturation
- High reliability and efficiency

■ Applications

- Industrial
- Automotive

■ Series

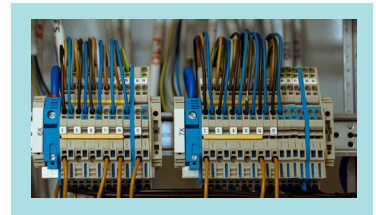
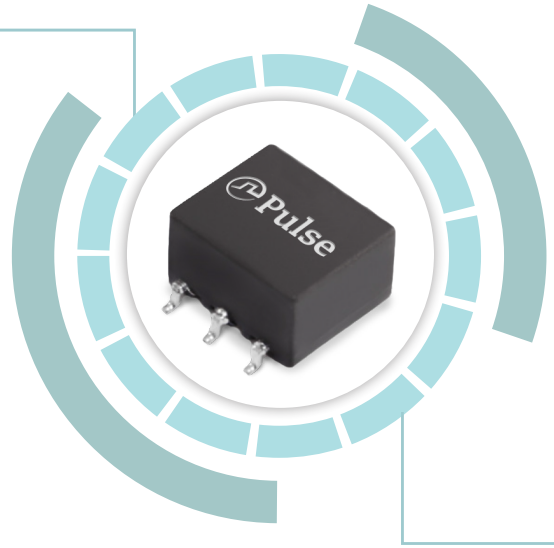
- Sizes range from 4 x 4 x 2mm to 8 x 8 x 3mm

HIGH ISOLATION

Transformers

PM2180

The Industrial communications bus can have multiple access points spread over a wide distance. Large ground loops and electrically noisy environments can create hazardous voltages which have implications for operator safety, protection of peripheral devices, and preserving the communications performance. Signal isolation can be built into the IC, however for higher isolation and efficiency an external isolated power supply is still required to power the transceiver, and the Pulse PH9185 series is ideally suited for this purpose.



■ Features and Benefits

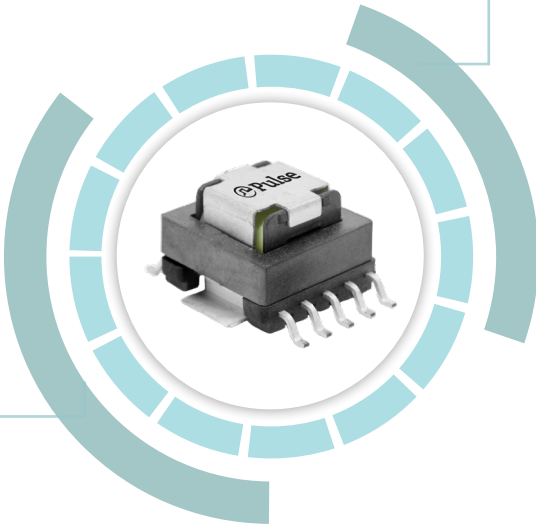
- Push Pull converter transformer
- 2500Vrms Isolation
- Up to 2 Watts
- Multiple Competitor Cross References
- Operational Insulation
- Compatible with multiple IC drivers

■ Applications

- Lighting
- Industrial Control
- Smart Grid
- Back Up Power

■ Series

- Multiple Turns Ratios from 1:1 to 8:9



SMT CURRENT Sense Transformers PM2170/71/72

Current sense magnetics are used as a low loss method for sensing the AC current in a circuit and also provide electrical and safety isolation between the source of the current (which can be connected to high voltage signals) and the measurement circuit (which is typically low voltage digital signals). We offer product ranging from 4A to 40A sensing, with isolation voltages from 500V to 5kV and insulation systems including functional, basic and reinforced.



■ Features and Benefits

- Low Profile SMT Design
- 500Vrms Isolation
- Low Primary Resistance
- 20KHz to 500KHz Frequency Range

■ Applications

- Switch Mode Power Supplies
- Safety and Control circuits
- Feedback control
- Overload sensing
- Motor Drives
- Solar Inverters
- EV Charging
- Industrial Control
- Welding Equipment

■ Series

- Senses current up to 35 Amps
- Multiple Turns Ratios
(50:1)
(100:1)
(200:1)

PRODUCT OVERVIEW

■ Surface Mount (SMT)

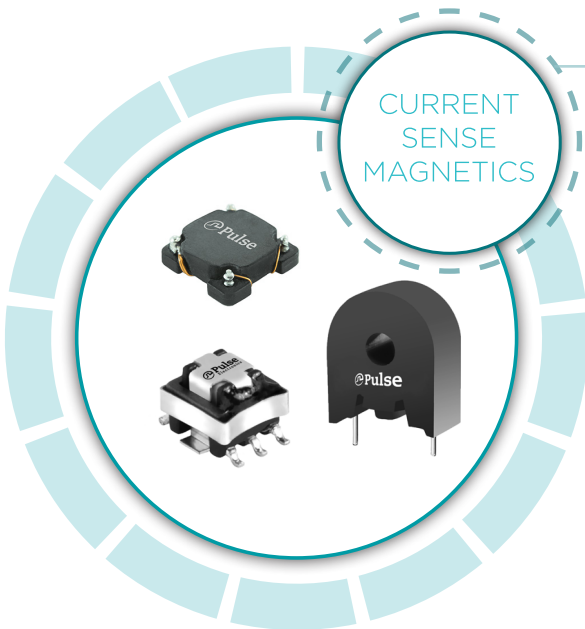
- Operational, Basic and Reinforced Isolation
- Up to 5Kv Isolation
- Wide range of Turns Ratios

■ Through Hole (THT)

- Reinforced Insulation for AC/DC Applications (3000 Vrms)



CURRENT SENSE MAGNETICS

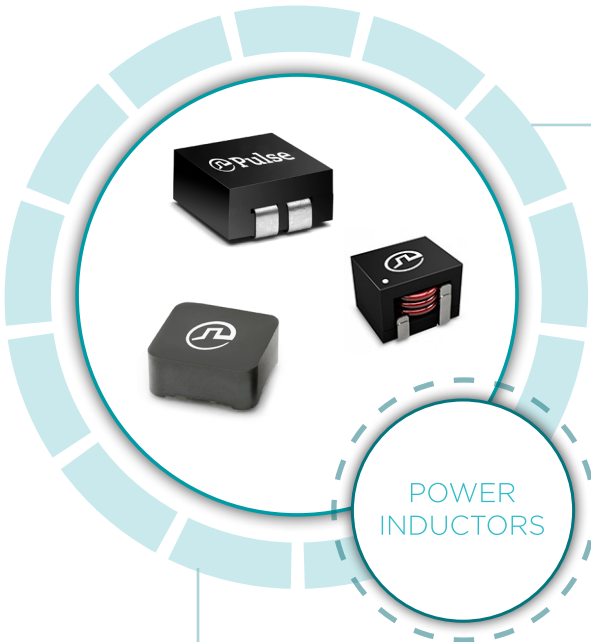


■ Surface Mount (SMT)

- Operational Insulation (500 Vrms)
- Five platforms (4 A, 10 A, 15 A, 20 A, 35 A)

■ Through Hole (THT)

- Reinforced Insulation (3000 Vrms)
- Multiple platforms (up to 38 A)



■ Surface Mount (SMT)

- Unshielded Drum Core Inductors (up to 30 A)
- Shielded Drum Core Inductors (up to 17 A)
- Power Bead Inductors (up to 100A+)
- Molded Powder Inductors (up to 55 A)
- Flat Coil Inductors (up to 58A)
- Planar and Round Wire Coil Inductors (up to 73 A)
- Toroid Inductors (up to 40 A)

■ Through Hole (THT)

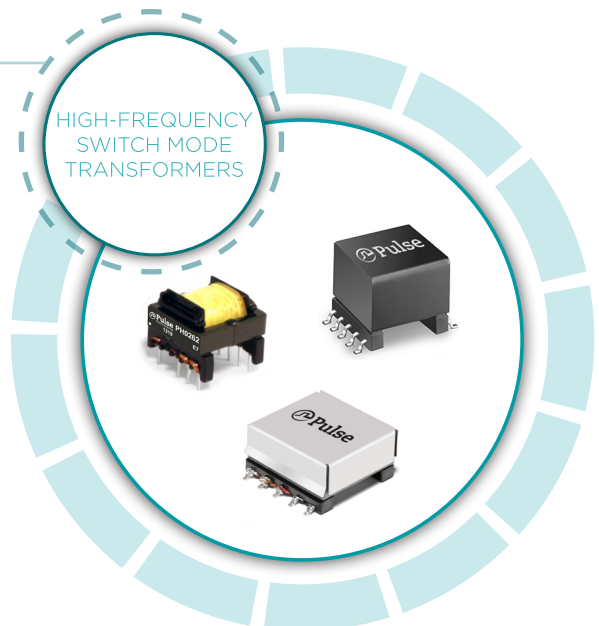
- Toroid Inductors (up to 48 A)
- Power Cube Inductors (up to 50 A)
- Power Bead Inductors (up to 80 Apk)

■ Surface Mount (SMT)

- Planar Transformers (30 W, 75 W, 150 W, 300 W)
- Wire wound Transformers (Up to 200 W)
- High Isolation Transformers (up to 5kVrms)
- Custom transformers available upon request

■ Through Hole (THT)

- Wire wound Transformers (Up to 500 W)
- Custom transformers available upon request



OVERVIEW

■ Surface Mount (SMT)

- Up to 14 A
- 500 Vrms and 1500 Vrms Isolation
- Over 10 package sizes available
- Custom designs available upon request

■ Through Hole (THT)

- Up to 23 A
- 3000 Vrms Isolation
- Multiple package sizes available



APPLICATION INFORMATION, MODELING AND RELIABILITY DATA

- Visit the Pulse Electronics website to view a wide range of technical papers
www.power.pulseelectronics.com

- LT Spice Models, 3D Step Files, Qualification Data and Reliability Numbers are all available upon request



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