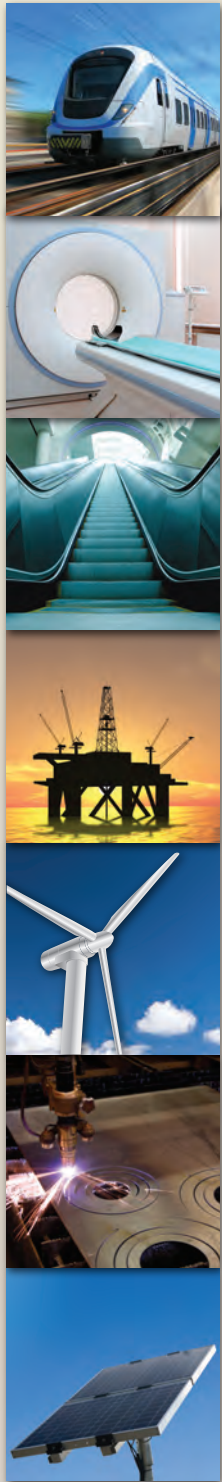


2013 Quick Reference Guide

- IGBTs
- SiC Modules
- MOSFET Modules
- IPMs
- DIIPM™
- Discrete Thyristors
- Discrete Rectifiers
- Thyristor and Diode Modules
- Fast Recovery and Three-Phase Diode Modules
- Assemblies
- IGBT Assemblies
- Custom Modules
- Gate Drivers
- DC-DC Converters



EXPERTISE ■ INNOVATION ■ RELIABILITY

IGBTs

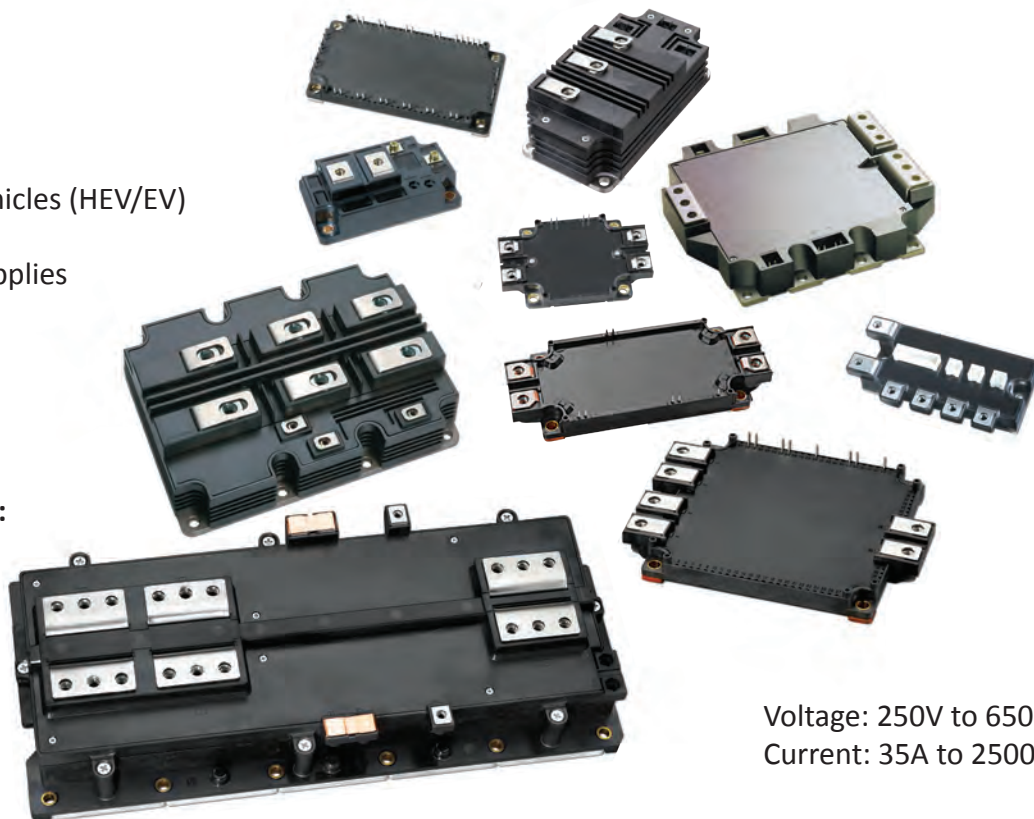
IGBT / HVIGBT

Applications Include:

- Hybrid Electric Vehicles (HEV/EV)
- Inverters
- Medical Power Supplies
- Motor Drives
- Servo Drives
- Traction Inverters
- UPS
- Welding

Circuit Configurations:

- Single
- Chopper
- Dual
- H-Bridge
- 6-Pac
- 7-Pac
- CIB



Voltage: 250V to 6500V
Current: 35A to 2500A

SiC Modules

Hybrid Si/SiC IGBT Modules

Applications Include:

- Energy Saving Power Systems (fans, pumps & consumer appliances)
- High Frequency Type Power Systems (UPS, high speed motor drives, induction heating, welder and robotics)
- High Temperature Power Systems (power electronics in electric vehicle and aviation systems)



SiC MOSFET Modules

Applications Include:

- High Efficiency Inverters
- High Frequency Power Supplies
- High Temperature Environment

Circuit Configurations:

- Single
- Dual
- In-Parallel
- Common Collector
- Common Emitter

Voltage: 1200V
Current: 100A

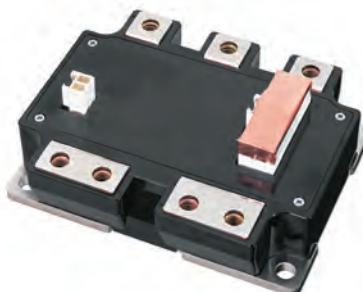
MOSFET Modules

Applications Include:

- Chopper
- Forklifts
- Off-Road Electric Vehicles
- Power Supplies

Circuit Configurations:

- 6-Pac
- Chopper (By Paralleling Legs)
- Dual (By Paralleling Legs)



Voltage: 75V to 150V
Current: 200A to 600A

IPMs

Applications Include:

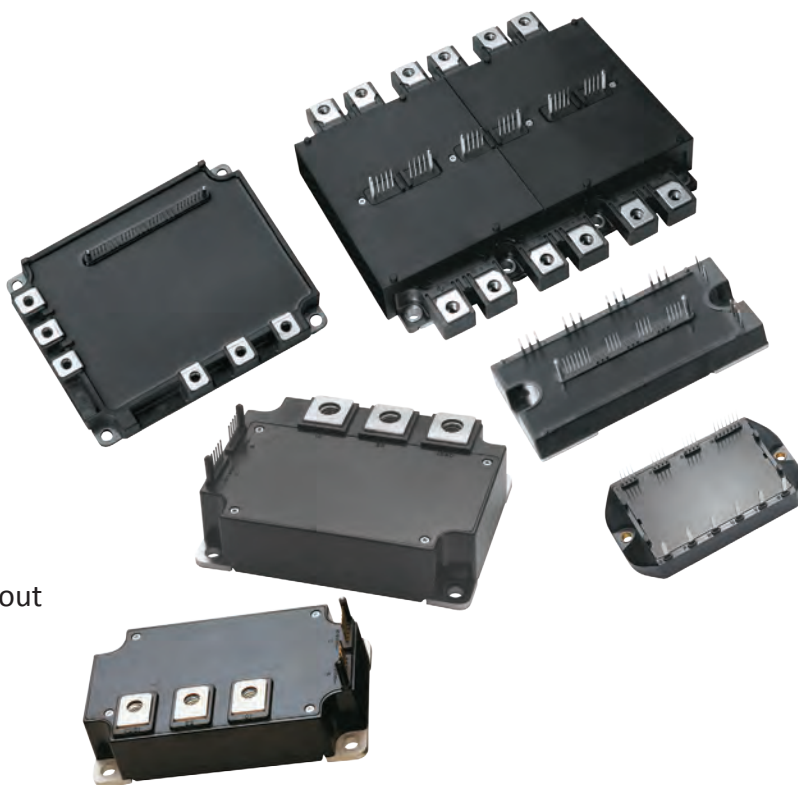
- Hybrid Electric Vehicles (HEV/EV)
- Motor Drives
- Photovoltaic (PV) Inverters
- Power Supplies
- Servo Drives
- UPS

Circuit Configurations:

- Dual
- H-Bridge [+Chopper(s)]
- 6-Pac
- 7-Pac

Features:

- Integrated Gate Drive
- Gate Drive Undervoltage (UV) Lockout
- Over Temperature Protection
- Short Circuit (SC) Protection
Using On-Chip Current Sensor



Voltage: 600V to 1200V
Current: 25A to 800A

DIIPM™

Applications Include:

- HVAC (Compressors, Blowers, Pumps)
- Refrigerators
- Small Motor Controls
- Washing Machines

Packages:

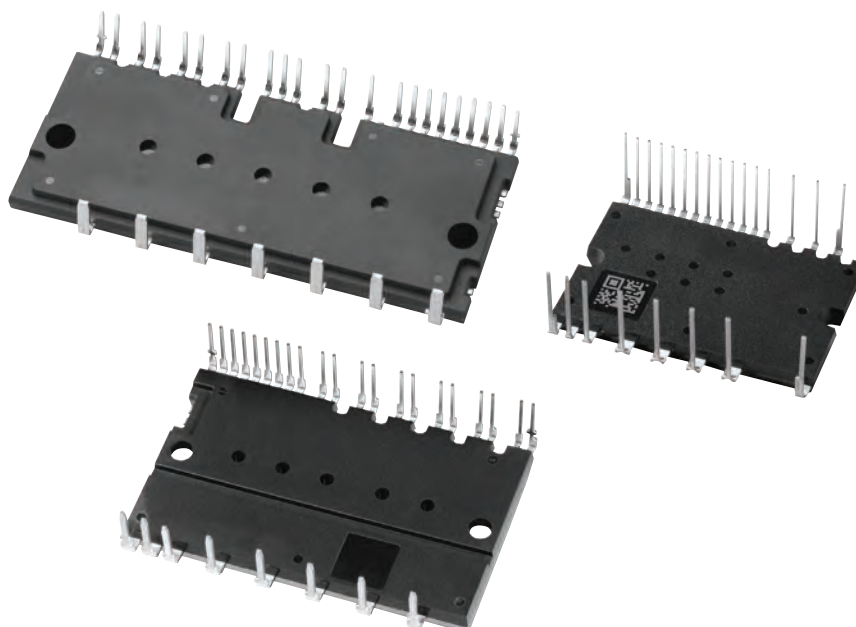
- DIP
- Mini
- Super Mini

Circuit Configurations:

- 6-Pac
- PFC

Features:

- Gate Drive
- Gate Drive Undervoltage (UV) Lockout
- Short Circuit (SC) Protection



Voltage: 600V to 1200V
Current: 3A to 75A

Discrete Thyristors

Phase Control SCR / Inverter Grade SCR

Applications Include:

- Battery Chargers
- Flexible AC Transmissions
- HVDC
- Induction Heating
- Medical Equipment
- Medium Voltage Inverters
- Motor Controls
- Power Supplies
- Soft Starters
- Traction Inverters
- Transportation
- UPS
- VAR Generators
- Welding

Packages:

- Discrete Discs
- Discrete Studs

Features:

- Nickel Plating Finish
- Hermetic Encapsulation for Long-Term Reliability to 1×10^{-6} cc/He/sec



Phase Control SCRs

Voltage: 100V to 6500V

Current: 40A to 5000A

Inverter Grade SCRs

Voltage: 200V to 2000V

Current: 40A to 2100A

Discrete Rectifiers

General Purpose Rectifiers

Applications Include:

- Battery Chargers
- Induction Heating/Melting
- Motor Controls
- Power Supplies
- Transportation
- Welding

Fast Recovery Rectifiers

Applications Include:

- Induction Heating
- Medical Equipment
- Motor Controls
- Transportation
- Welding

Packages:

- Discrete Discs
- Discrete Studs

Features:

- Nickel Plating Finish
- Hermetic Encapsulation for Long-Term Reliability to 1×10^{-6} cc/He/sec



General Purpose

Voltage: 100V to 6500V

Current: 100A to 12,000A

Fast Recovery

Voltage: 200V to 3600V

Current: 125A to 1500A

Thyristor & Diode Modules

POW-R-BLOK™

Applications Include:

- Battery Chargers
- Induction Heating/Melting
- Medical Equipment
- Motor Controls
- Power Supplies
- UPS
- Welding

POW-R-BRIK™

Applications Include:

- AC Motor Starters
- DC Motor Controls
- Mining Power Centers
- Resistance Welding Controls
- Transportation

Circuit Configurations:

- Single
- Dual
- Split Dual
- Common Anode
- Common Cathode
- AC Switch

POW-R-BLOK™

Voltage: 600V to 5000V
Current: 20A to 2500A

POW-R-BRIK™

Voltage: 600V to 5000V
Current: 300A to 1585A

Fast Recovery & Three-Phase Diode Modules

Fast Recovery Modules

Applications Include:

- Motor Controls
- Power Supplies
- Switching Power Supplies
- Transportation
- Welding

Circuit Configurations:

- Single
- Dual
- Common Anode
- Common Cathode

Three-Phase Diode Modules

Applications Include:

- AC Motor Drive, Front End
- AC-DC Rectifiers
- DC Power Supplies

Circuit Configuration:

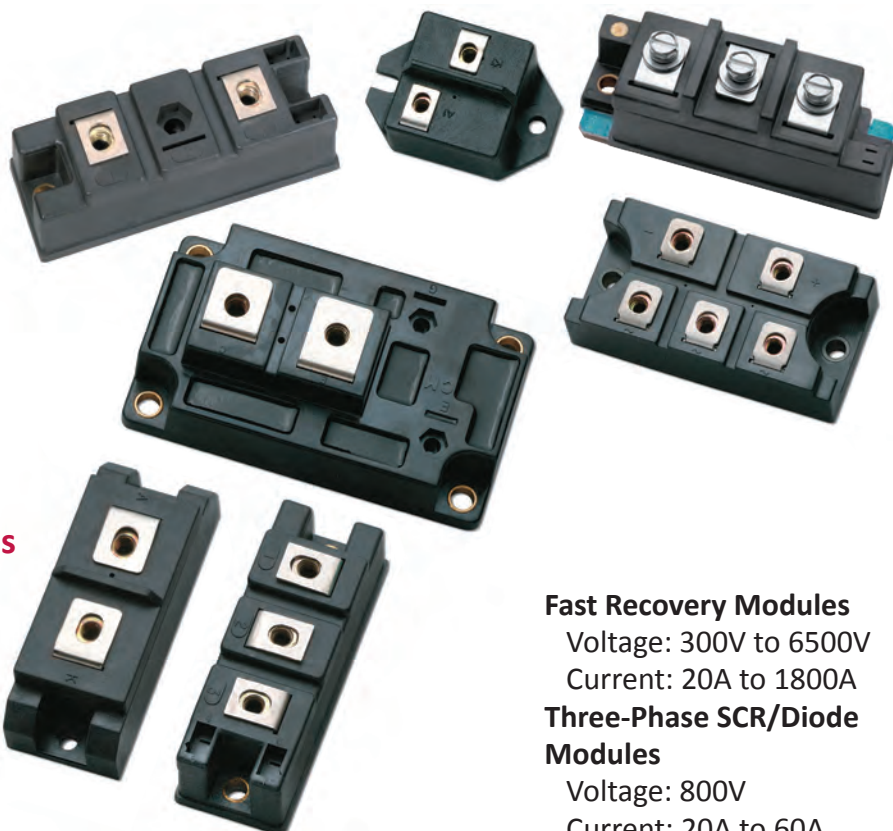
- Three-Phase Circuit

Fast Recovery Modules

Voltage: 300V to 6500V
Current: 20A to 1800A

Three-Phase SCR/Diode Modules

Voltage: 800V
Current: 20A to 60A



Assemblies

Air Cooled / Liquid Cooled / Integrated Power Structures

Applications Include:

- Battery Chargers
- Induction Heating/Melting
- Motor Controls
- Motor Starters
- Power Supplies
- Transportation
- UPS
- Welding

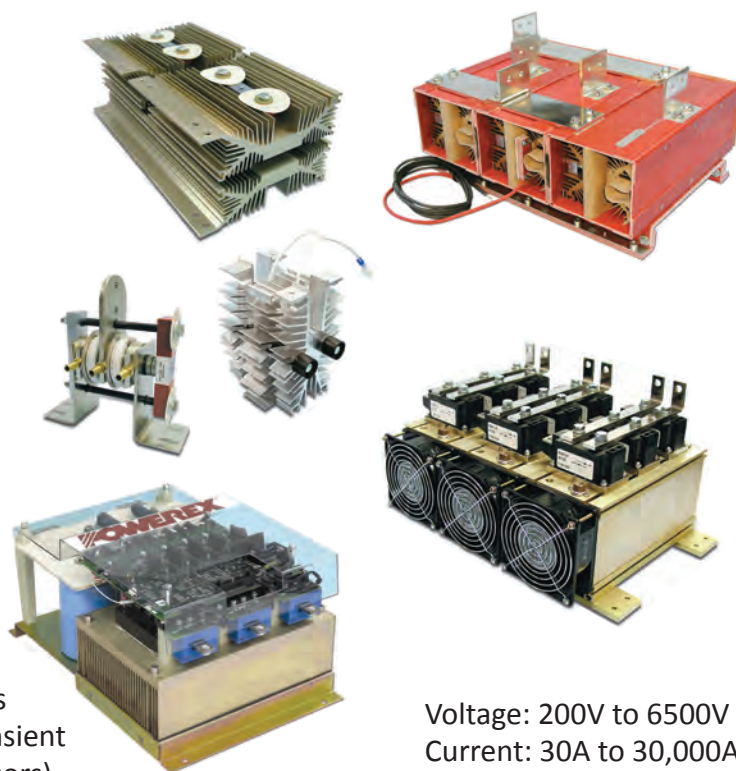
Circuit Configurations:

- Single
- Half-Bridge
- AC Switch
- Common Cathode/Common Anode
- Single-Phase Bridge
- Three-Phase Bridge

Options Available in Engineered Assemblies:

- | | | |
|------------|-------------------|----------------|
| • Bus Bars | • Insulators | • Snubbers |
| • Fans | • Terminal Blocks | (R-C Transient |
| • Fuses | • Thermal Sensors | Suppressors) |

Note: Custom Assemblies Also Available



Voltage: 200V to 6500V
Current: 30A to 30,000A

IGBT Assemblies

POW-R-PAK-GenII™

Applications Include:

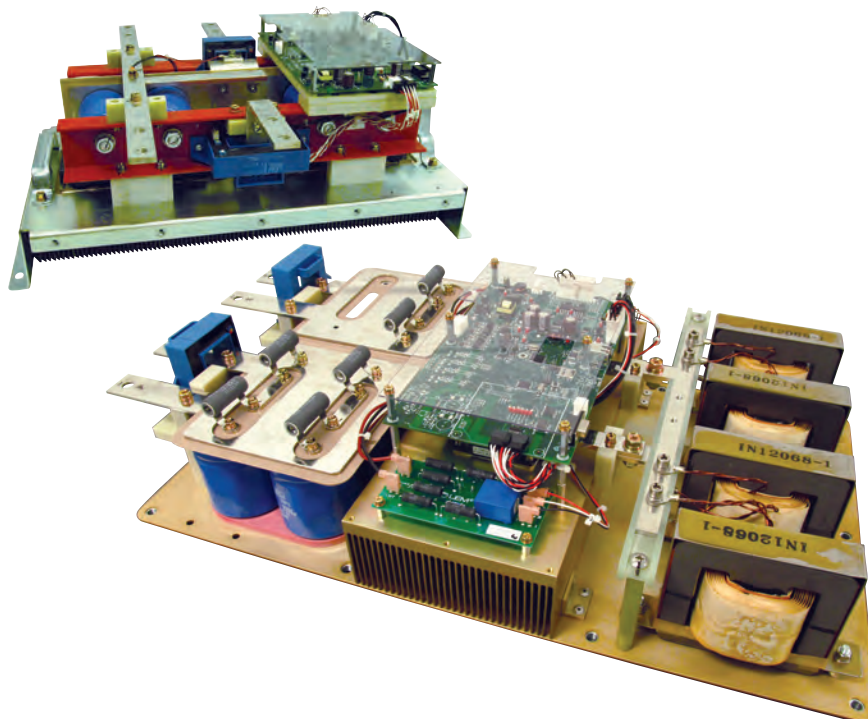
- Distributed Power Generation
- Energy Storage
- Industrial Power Supplies
- Motor Drives
- Power Quality

Circuit Configurations:

- Single, Brake
- Half-Bridge
- H-Bridge
- Three-Phase Bridge
- Three-Phase Bridge + Brake
- Chopper

Additional Available Options:

- Blower/Fan
- Application Specific



Voltage: 250V to 3300V
Current: 50A to 2800A

Note: Custom IGBT Assemblies Also Available

Custom Modules

Commercial / Moisture Resistant / Hermetic

Applications Include:

- Customer Specific

Substrates:

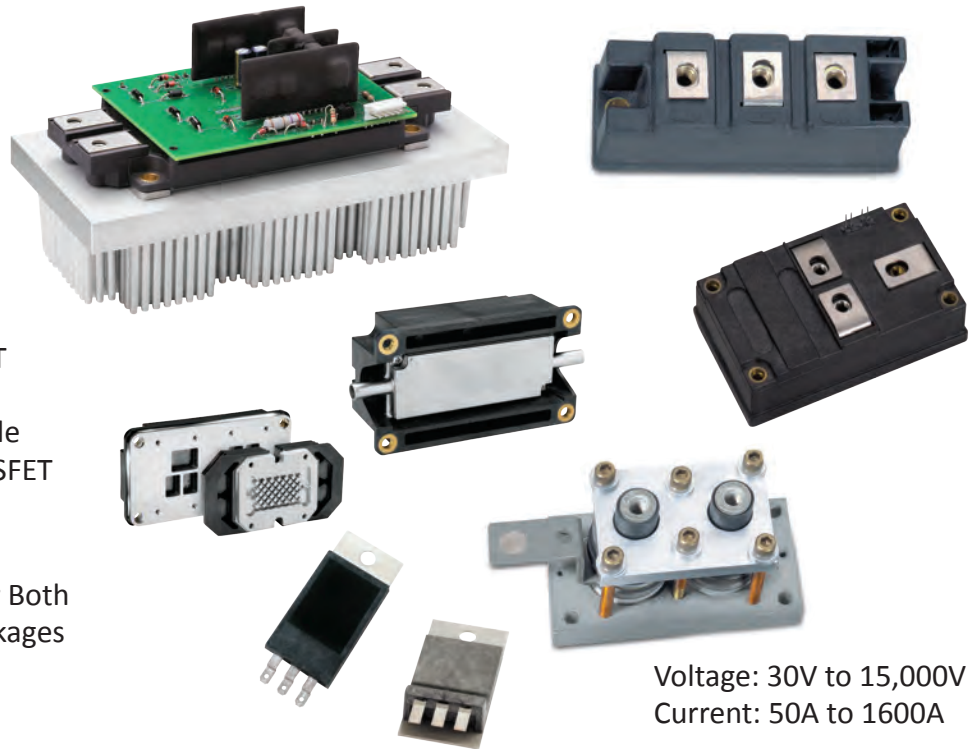
- Alumina
- Aluminum Nitride
- BeO
- IMS

Die Technology:

- Diode
- FR Diode
- GTO
- HVIGBT
- IGBT
- MOSFET
- SCR
- SiC Diode
- SiC MOSFET

Packages:

- Custom Development for Both Plastic and Hermetic Packages
- Picture Frame
- Standard IGBT Cases



Voltage: 30V to 15,000V
Current: 50A to 1600A

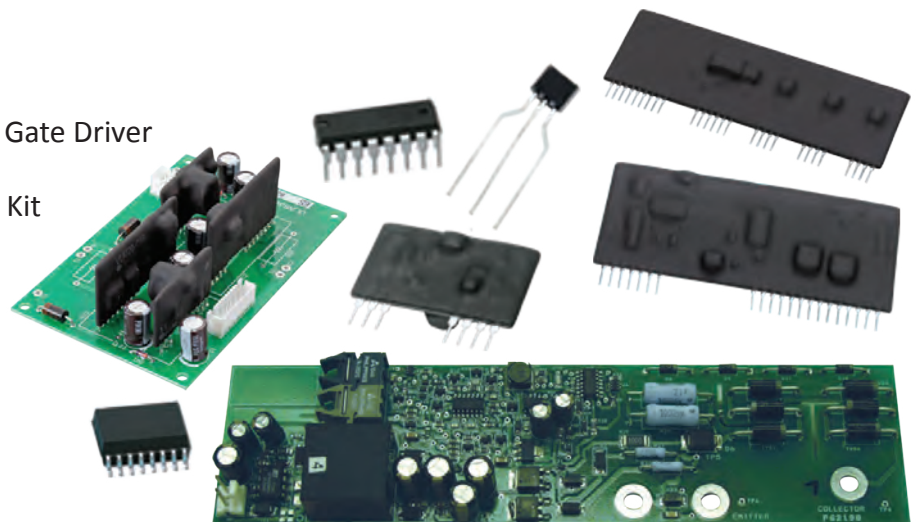
Gate Drivers

Applications Include:

- High Voltage Integrated Circuit Gate Driver
- IGBT Gate Driver Board
- IGBT Gate Driver Development Kit
- TRIAC Trigger

Packages:

- DIP
- PCB
- SIP
- SMT/SOP
- TO-92S



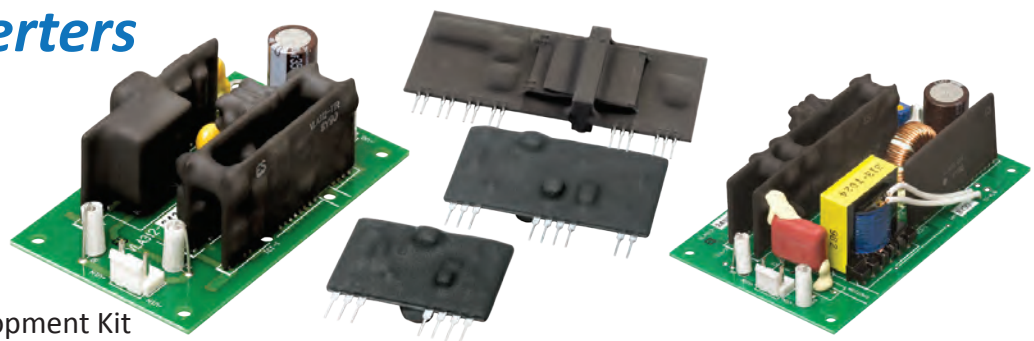
DC-DC Converters

Applications Include:

- Industrial Power Conversions

Packages:

- Dual-In-Line
- Prototype IPM Development Kit
- SIP



Powerex is a leading supplier of discrete devices, modules and integrated high power semiconductor solutions, supporting many markets, including:

AC, DC and Servo Drives (Low and Medium Voltage)

Aircraft

- Electro-Hydrostatic Actuators
- Power Generators

Alternative Energy and Distributed Power

- Wind
- Photovoltaic
- Flywheel
- Fuel Cell
- Microturbine

Electric Vehicle

Induction Heating

Industrial Pump Controls

Medical Power Supplies

- CT
- MRI
- X-Ray

Power Generation and Distribution

Pulsed Power

Transportation

- Propulsion and Auxiliary Power for Rail and Shipboard

Uninterruptible Power Supplies (UPS)

Welding

White Goods and HVAC

Powerex and its strategic partners maintain a commitment to research and innovative product development to meet customer power semiconductor requirements, including:

- Decreased Component Size
- Reduced Costs
- Increased Energy Efficiency
- Switches that
 - Operate at Higher frequencies
 - Are More Reliable
 - Offer Integrated Functions

This broad product line is enhanced by business units devoted to the development of

- Custom Modules
- Customer Specific Assemblies

Powerex standard and custom products are supported by its world-class applications engineering staff.



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