2012 Quick Reference Guide

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EXPERTISE  ■  INNOVATION  ■  RELIABILITY
IGBTs

IGBT / HVIGBT / CSTBT

Applications Include:
- Alternative Fuel Vehicles (EV)
- Inverters
- Medical Power Supplies
- Motor Drives
- Servo Drives
- Traction Inverters
- UPS
- Welding

Circuit Configurations:
- Single
- Chopper
- Dual
- 4-Pac
- 6-Pac
- 7-Pac
- CIB

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

Hybrid IGBTs

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 vehicles & aviation systems)

Circuit Configurations:
- Independent
- Dual
- In Parallel
- Common Collector
- Common Emitter

Voltage: 1200V
Current: 100A

MOSFET Modules

All SiC MOSFET Modules / Si MOSFETs

SiC MOSFETs
Applications Include:
- High Efficiency Inverters
- High Frequency Power Supplies
- High Temperature Environment

Circuit Configurations:
- Independent
- Dual
- In Parallel
- Common Collector
- Common Emitter

Si MOSFETs
Applications Include:
- Chopper
- Forklifts
- Off-Road Electric Vehicles
- Power Supplies
- UPS

Circuit Configurations:
- Chopper (By Paralleling Legs)
- Dual (By Paralleling Legs)
- 6-Pac

Voltage: 75V to 1200V
Current: 100A to 600A

For Powerex Support in your country / region, go to www.pwrx.com/SalesSupport.aspx
**IPMs**

**IPM / HVIPM**

Applications Include:
- Alternative Fuel Vehicles (EV)
- Motor Drives
- Photovoltaic (PV) Inverters
- Power Supplies
- Servo Drives
- Traction Inverters
- UPS

Circuit Configurations:
- Dual
- H-Bridge
- H-Bridge + Chopper
- H-Bridge + 2 Choppers
- 6-Pac
- 7-Pac

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

Voltage: 600V to 3300V
Current: 25A to 1200A

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**DIPIPM™**

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

Packages:
- Medium Power
- 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

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Voltage: 200V to 6500V
Current: 30A to 30000A

Fast Recovery Modules
Voltage: 300V to 6500V
Current: 20A to 1800A

Three-Phase Diode Modules
Voltage: 800V to 1600V
Current: 20A to 150A

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Options Available in Engineered Assemblies:
- Bus Bars
- Insulators
- Snubbers
- Fans
- Terminal Blocks
- Fuses
- Thermal Sensors
- Suppressors

Note: Custom Assemblies Also Available
**Accessories**

**Applications Include:**
- Acceleration Sensors
- Box and Bar Clamps
- DC-DC Converters to Provide +15V Power Supply for IGBT Gate Drivers
- Development Kits
- HVICs for Driving IGBTs and MOSFETs in Ballast, Motor Drive and Power Supply Applications
- Hybrid IC Gate Drives
- Designed for Driving IGBTs with Ratings up to 1400A/1200V and 2400A/1700V
- SBS for Driving Triacs
- Transistor Arrays

**Packages:**
- DIP
- Hybrid IC
- SIP
- SMT/SOP
- PCB

**Discrete Thyristors**

**Phase Control SCR / Inverter Grade SCR**

**Applications Include:**
- Battery Chargers
- Flexible AC Transmissions
- Induction Heating
- Medical Equipment
- Medium Voltage Inverters
- Motor Controls
- Power Supplies
- Traction Inverters
- Transportation
- UPS
- VAR Generators
- Welding

**Packages:**
- Discrete Discs
- Discrete Studs

**Phase Control SCRs**
- Voltage: 100V to 6500V
- Current: 40A to 5000A

**Inverter Grade SCRs**
- Voltage: 200V to 2000V
- Current: 40A to 2100A

For Powerex Support in your country / region, go to www.pwrx.com/SalesSupport.aspx
**Discrete Rectifiers**

**General Purpose Rectifiers**

**Applications Include:**
- Battery Chargers
- Induction Heating/Melting
- Motor Controls
- Power Supplies
- Transportation
- Welding

**Packages:**
- Discrete Discs
- Discrete Studs

**Fast Recovery Rectifiers**

**Applications Include:**
- Induction Heating
- Medical Equipment
- Motor Controls
- Transportation
- Welding

**Packages:**
- Discrete Discs
- Discrete Studs

**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

**General Purpose**
- Voltage: 100V to 6500V
- Current: 100A to 10000A

**Fast Recovery**
- Voltage: 200V to 4500V
- Current: 125A to 2000A

**POW-R-BLOK™**
- Voltage: 600V to 11,000V
- Current: 20A to 2500A

**POW-R-BRIK™**
- Voltage: 1200V to 5000V
- Current: 300A to 1585A

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**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  

**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  
- Fans  
- Fuses  
- Insulators  
- Terminal Blocks  
- Snubbers  
- (R-C Transient Suppressors)  
- Thermal Sensors  

Note: Custom Assemblies Also Available  

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**IGBT Assemblies**

**POW-R-PAK**

**Applications Include:**
- Energy Storage
- Distributed Power Generation
- Industrial Power Supplies
- Motor Drives
- Power Quality

**Circuit Configurations:**
- H-Bridge
- Half-Bridge
- Three-Phase Bridge
- Three-Phase Bridge + Brake

**Additional Available Options:**
- Blower/Fan
- Converter/Inverter
- Diode or SCR
- Dual Inverter or Converter

Note: Custom IGBT Assemblies Also Available

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

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**Custom Modules**

**Commercial / Moisture Resistant / Hermetic**

**Applications Include:**
- Customer Specific

**Substrates:**
- Alumina
- Aluminum Nitride
- BeO
- IMS

**Die Technology:**
- IGBT
- MOSFET
- SCR
- SiC MOSFET
- SiC Diode
- Bipolar
- Diode
- FR Diode
- GTO
- HVIGBT

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

**Voltage:** 30V to 15,000V  
**Current:** 50A to 1500A

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Powerex is a leading supplier of discrete, modular 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.