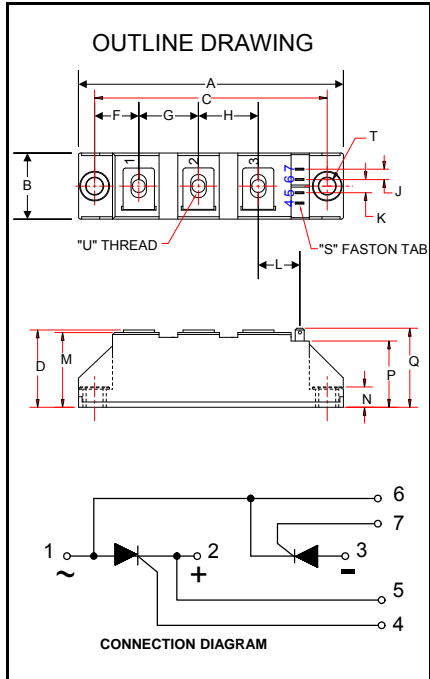


Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (724) 925-7272

**POW-R-BLOK™**  
**Dual SCR Isolated Module**  
**40 Amperes / Up to 1800 Volts**



**CD43\_\_40B**  
**Dual SCR Isolated**  
**POW-R-BLOK™ Module**  
 40 Amperes / Up to 1800 Volts

**Description:**

Powerex Dual SCR Modules are designed for use in applications requiring phase control and isolated packaging. The modules are isolated for easy mounting with other components on a common heatsink. POW-R-BLOK™ has been tested and recognized by the Underwriters Laboratories.

**Features:**

- Electrically Isolated Heatsinking
- DBC Alumina (Al<sub>2</sub>O<sub>3</sub>) Insulator
- Copper Baseplate
- Low Thermal Impedance for Improved Current Capability
- UL Recognized (E78240)

**Benefits:**

- No Additional Insulation Components Required
- Easy Installation
- No Clamping Components Required
- Reduce Engineering Time

**Applications:**

- Bridge Circuits
- AC & DC Motor Drives
- Battery Supplies
- Power Supplies
- Large IGBT Circuit Front Ends
- Lighting Control
- Heat & Temperature Control
- Welders

**CD43 Outline Dimensions**

| Dimension | Inches     | Millimeters |
|-----------|------------|-------------|
| A         | 3.66       | 93          |
| B         | 0.79       | 20          |
| C         | 3.15       | 80          |
| D         | 1.18       | 30          |
| F         | 0.61       | 15.5        |
| G         | 0.79       | 20          |
| H         | 0.79       | 20          |
| J         | 0.16       | 4           |
| K         | 0.22       | 5.7         |
| L         | 0.59       | 15          |
| M         | 1.10       | 28          |
| N         | 0.31       | 8           |
| P         | 0.94       | 24          |
| Q         | 1.16       | 29.4        |
| S         | 0.11 x .03 | 2.8 x 0.8   |
| T         | 0.25       | 6.4         |
| U         | M5         | M5          |

Note: Dimensions are for reference only.

**Ordering Information:**

Select the complete nine digit module part number from the table below.  
 Example: CD431640B is a 1600Volt, 40 Ampere Dual SCR Isolated POW-R-BLOK™ Module

| Type | Voltage<br>Volts<br>(x100) | Current<br>Amperes | Version |
|------|----------------------------|--------------------|---------|
| CD43 | 08                         | 40                 | B       |
|      | 12                         |                    |         |
|      | 14                         |                    |         |
|      | 16                         |                    |         |
|      | 18                         |                    |         |

**Absolute Maximum Ratings**

| Characteristics  | Conditions  | Symbol                |                 | Units                   |
|--|---|-----------------------|-----------------|-------------------------|
| Repetitive Peak Forward and Reverse Blocking Voltage       |   | $V_{DRM}$ & $V_{RRM}$ | up to 1800      | V                       |
| Non-Repetitive Peak Reverse Blocking Voltage (t < 5 msec)  |   | $V_{RSM}$             | $V_{RRM} + 100$ | V                       |
| RMS Forward Current  | 180° Conduction, $T_C=85^\circ\text{C}$                   | $I_{T(RMS)}$          | 63              | A                       |
| Average Forward Current                                    | 180° Conduction, $T_C=85^\circ\text{C}$                   | $I_{T(AV)}$           | 40              | A                       |
| Peak One Cycle Surge Current, Non-Repetitive               | 60 Hz, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$  | $I_{TSM}$             | 750             | A                       |
|  | 60 Hz, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$    | $I_{TSM}$             | 890             | A                       |
|  | 60 Hz, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$     | $I_{TSM}$             | 985             | A                       |
|  | 50 Hz, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$  | $I_{TSM}$             | 715             | A                       |
|  | 50 Hz, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$    | $I_{TSM}$             | 850             | A                       |
|  | 50 Hz, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$     | $I_{TSM}$             | 940             | A                       |
| $I^2t$ for Fusing for One Cycle, 8.3 milliseconds          | 8.3 ms, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$ | $I^2t$                | 2330            | $\text{A}^2 \text{sec}$ |
|  | 8.3 ms, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$   | $I^2t$                | 3300            | $\text{A}^2 \text{sec}$ |
|  | 8.3 ms, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$    | $I^2t$                | 4030            | $\text{A}^2 \text{sec}$ |
|  | 10 ms, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$  | $I^2t$                | 2560            | $\text{A}^2 \text{sec}$ |
|  | 10 ms, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$    | $I^2t$                | 3610            | $\text{A}^2 \text{sec}$ |
|  | 10 ms, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$     | $I^2t$                | 4420            | $\text{A}^2 \text{sec}$ |
| Maximum Rate-of-Rise of On-State Current, (Non-Repetitive) | $T_j=125^\circ\text{C}$                                   | di/dt                 | 150             | A/ $\mu\text{s}$        |
| Operating Temperature                                      |   | $T_j$                 | -40 to +125     | $^\circ\text{C}$        |
| Storage Temperature  |   | $T_{stg}$             | -40 to +125     | $^\circ\text{C}$        |
| Max. Mounting Torque, M5 Mounting Screw on Terminals       |   |                       | 25              | in.-Lb.                 |
|  |   |                       | 3               | Nm                      |
| Max. Mounting Torque, Module to Heatsink                   |   |                       | 44              | in.-Lb.                 |
|  |   |                       | 5               | Nm                      |
| Module Weight, Typical                                     |   |                       | 95              | g                       |
|  |   |                       | 3.35            | oz.                     |
| V Isolation @ 25C  | 50 – 60 Hz, 1 minute                                      | $V_{rms}$             | 3000            | V                       |
| Circuit to base, all terminals shorted together            | 50 – 60 Hz, 1 second                                      | $V_{rms}$             | 3500            | V                       |

Information presented is based upon manufacturers testing and projected capabilities. This information is subject to change without notice. The manufacturer makes no claim as to the suitability of use, reliability, capability, or future availability of this product.

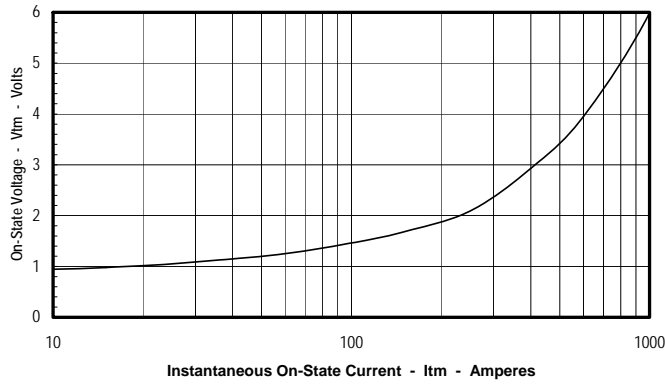
**Electrical Characteristics,  $T_J=25^\circ\text{C}$  unless otherwise specified**

| Characteristics                         | Symbol      | Test Conditions  | Min.        | Max.      | Units                                |
|---|-------------|--|-------------|-----------|--------------------------------------|
| Repetitive Peak Forward Leakage Current | $I_{DRM}$   | Up to 1800V, $T_J=125^\circ\text{C}$   |             | 20        | mA                                   |
| Repetitive Peak Reverse Leakage Current | $I_{RRM}$   | Up to 1800V, $T_J=125^\circ\text{C}$   |             | 20        | mA                                   |
| Peak On-State Voltage                   | $V_{FM}$    | $I_{TM}=200\text{A}$   |             | 1.95      | V                                    |
| Threshold Voltage, Low-level            | $V_{(TO)1}$ | $T_J = 125^\circ\text{C}$ , $I = 16.7\% \times \pi I_{T(AV)}$ to $\pi I_{T(AV)}$ |             | 1.0       | V                                    |
| Slope Resistance, Low-level             | $r_{T1}$    |  |             | 4.5       | m $\Omega$                           |
| Minimum dV/dt                           | dV/dt       | $T_J=125^\circ\text{C}$ , Up to 800V<br>$T_J=125^\circ\text{C}$ , 1200V – 1800V  | 500<br>1000 |           | V/ $\mu\text{s}$<br>V/ $\mu\text{s}$ |
| Turn-Off Time (Typical)                 | $t_{off}$   | $T_J = 125^\circ\text{C}$  | 40 - 100    | (Typical) | $\mu\text{s}$                        |
| Gate Trigger Current                    | $I_{GT}$    | $T_J = 25^\circ\text{C}$ , $V_D=6\text{V}$ , Resistive Load                      |             | 150       | mA                                   |
| Gate Trigger Voltage                    | $V_{GT}$    | $T_J = 25^\circ\text{C}$ , $V_D=6\text{V}$ , Resistive Load                      |             | 3.0       | Volts                                |
| Non-Triggering Gate Voltage             | $V_{GDM}$   | $T_J=125^\circ\text{C}$ , $V_D=V_{DRM}$  |             | 0.25      | Volts                                |
| Non-Triggering Gate Current             | $I_{GDM}$   | $T_J=125^\circ\text{C}$ , $V_D=V_{DRM}$  |             | 6         | mA                                   |
| Holding Current                         | $I_H$       | $T_J = 25^\circ\text{C}$   |             | 150       | mA                                   |
| Latching Current                        | $I_L$       | $T_J = 25^\circ\text{C}$   |             | 300       | mA                                   |

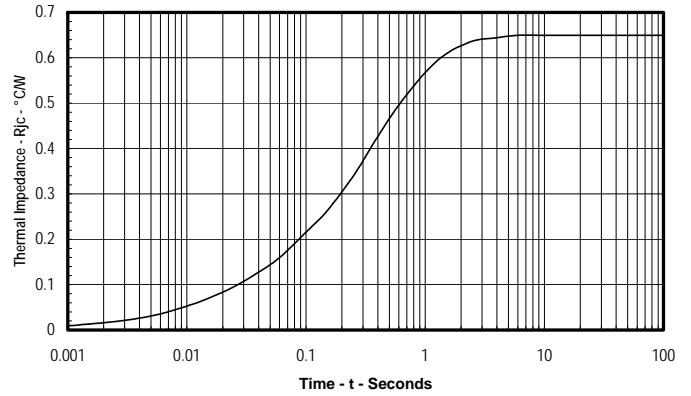
**Thermal Characteristics**

| Characteristics                                      | Symbol           |  | Max.         | Units                                    |
|--|------------------|--|--------------|--|
| Thermal Resistance, Junction to Case<br>DC Operation | $R_{\theta J-C}$ | Per Module, both conducting<br>Per Junction, both conducting | 0.33<br>0.65 | $^\circ\text{C/W}$<br>$^\circ\text{C/W}$ |
| Thermal Resistance, Case to Sink Lubricated          | $R_{\theta C-S}$ | Per Module   | 0.1          | $^\circ\text{C/W}$                       |

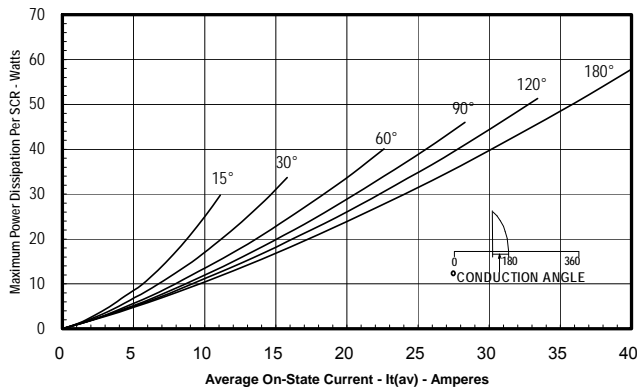
**Maximum On-State Forward Voltage Drop**  
 (T<sub>j</sub> = 125 °C)



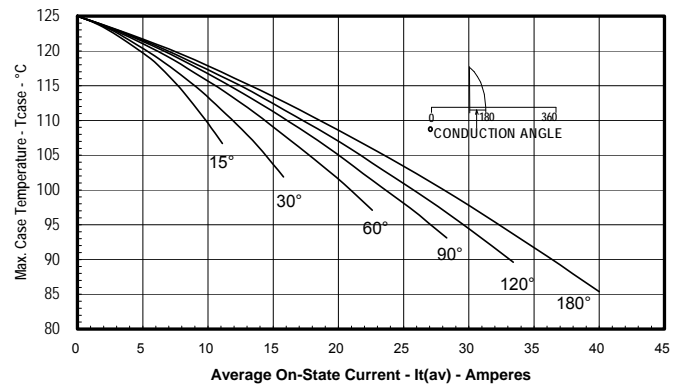
**Maximum Transient Thermal Impedance**  
 (Junction to Case)



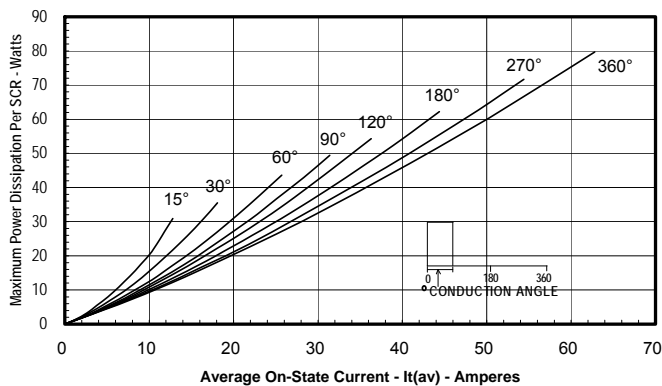
**Maximum On-State Power Dissipation**  
 (Sinusoidal Waveform)



**Maximum Allowable Case Temperature**  
 (Sinusoidal Waveform)



**Maximum On-State Power Dissipation**  
 (Rectangular Waveform)



**Maximum Allowable Case Temperature**  
 (Rectangular Waveform)

