

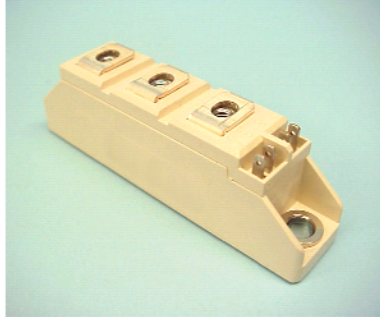
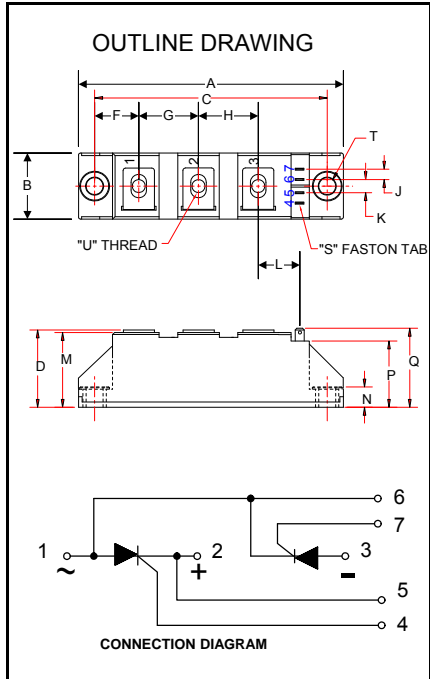


# THE DATASHEET OF CD431290B



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

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



**CD43\_\_90B**  
**Dual SCR Isolated**  
**POW-R-BLOK™ Module**  
 90 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: CD431690B is a 1600Volt, 90 Ampere Dual SCR Isolated *POW-R-BLOK™* Module

Type	Voltage Volts (x100)	Current Amperes	Version
CD43	08 12 14 16 18	90	B

**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, $T_C=84^\circ\text{C}$	$I_{T(RMS)}$	150	A
Average Forward Current	180° Conduction, $T_C=84^\circ\text{C}$	$I_{T(AV)}$	95	A
Peak One Cycle Surge Current, Non-Repetitive	60 Hz, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I_{TSM}$	1570	A
	60 Hz, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I_{TSM}$	1870	A
	60 Hz, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$	$I_{TSM}$	2100	A
	50 Hz, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I_{TSM}$	1500	A
	50 Hz, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I_{TSM}$	1785	A
	50 Hz, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$	$I_{TSM}$	2000	A
$I^2t$ for Fusing for One Cycle, 8.3 milliseconds	8.3 ms, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I^2t$	10,270	$\text{A}^2 \text{sec}$
	8.3 ms, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I^2t$	14,520	$\text{A}^2 \text{sec}$
	8.3 ms, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$	$I^2t$	18,300	$\text{A}^2 \text{sec}$
	10 ms, 100% $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I^2t$	11,250	$\text{A}^2 \text{sec}$
	10 ms, No $V_{RRM}$ reapplied, $T_j=125^\circ\text{C}$	$I^2t$	15,910	$\text{A}^2 \text{sec}$
	10 ms, No $V_{RRM}$ reapplied, $T_j=25^\circ\text{C}$	$I^2t$	20,000	$\text{A}^2 \text{sec}$
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**

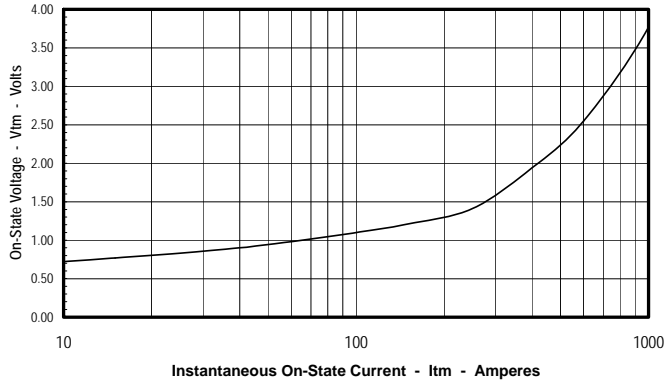
Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Forward Leakage Current	$I_{DRM}$	Up to 1800V, $T_J=125^\circ\text{C}$		20	mA
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	Up to 1800V, $T_J=125^\circ\text{C}$		20	mA
Peak On-State Voltage	$V_{TM} / V_{FM}$	$I_{TM} / I_{FM}=300\text{A}$		1.65	V
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_J = 125^\circ\text{C}$ , $I = 16.7\% \times \pi I_{T(AV)}$ to $\pi I_{T(AV)}$		0.9	V
Slope Resistance, Low-level	$r_{T1}$			2.0	m $\Omega$
Minimum dV/dt	dV/dt	$T_J=125^\circ\text{C}$ , Up to 800V $T_J=125^\circ\text{C}$ , 1200 - 1800V	500 1000		V/ $\mu\text{s}$ V/ $\mu\text{s}$
Turn-Off Time (Typical)	$t_{off}$	$T_J = 25^\circ\text{C}$	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	$I_H$	$T_J = 25^\circ\text{C}$		250	mA
Latching Current	$I_L$	$T_J = 25^\circ\text{C}$		600	mA

**Thermal Characteristics**

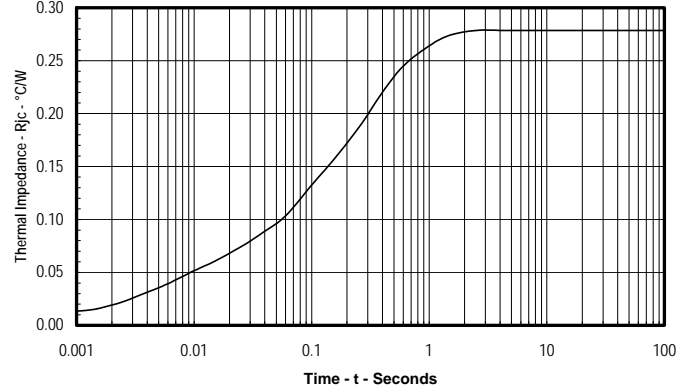
Characteristics	Symbol		Max.	Units
Thermal Resistance, Junction to Case DC Operation	$R_{\theta J-C}$	Per Module, both conducting Per Junction, both conducting	0.14 0.28	$^\circ\text{C}/\text{W}$ $^\circ\text{C}/\text{W}$
Thermal Resistance, Case to Sink Lubricated	$R_{\theta C-S}$	Per Module	0.1	$^\circ\text{C}/\text{W}$

### POW-R-BLOK™ Dual SCR Isolated Module 90 Amperes / Up to 1800 Volts

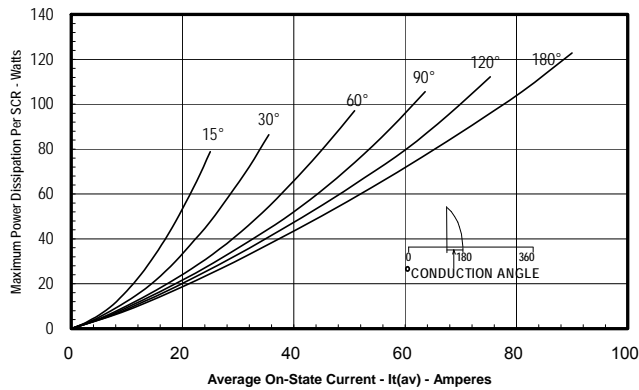
**Maximum On-State Forward Voltage Drop**  
( $T_j = 125^\circ\text{C}$ )



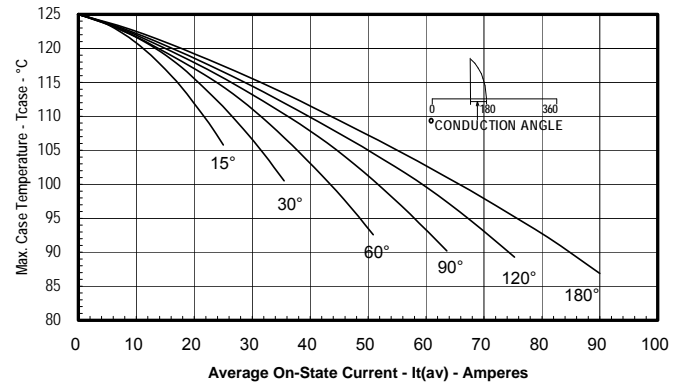
**Maximum Transient Thermal Impedance**  
(Junction to Case)



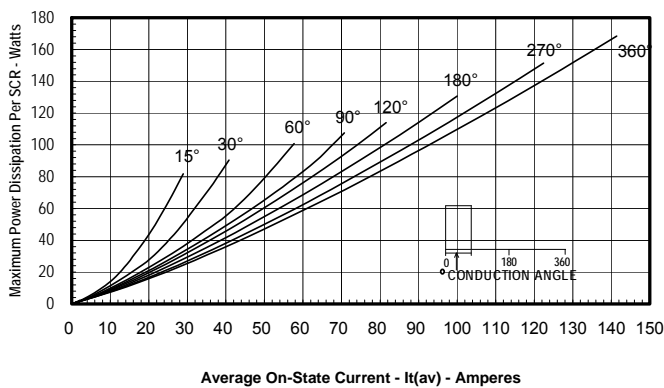
**Maximum On-State Power Dissipation**  
(Sinusoidal Waveform)



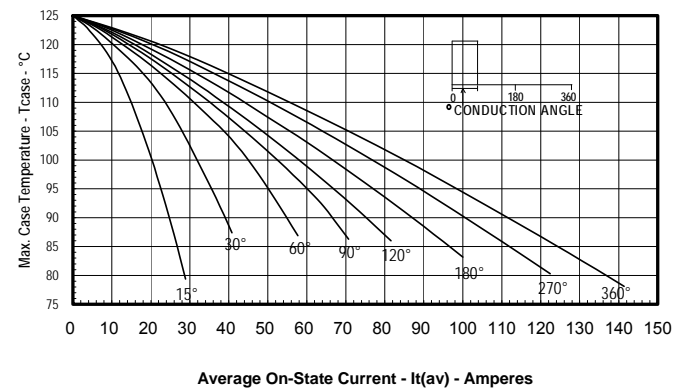
**Maximum Allowable Case Temperature**  
(Sinusoidal Waveform)



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



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



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-  Shortage Management
-  Alternative Solution
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